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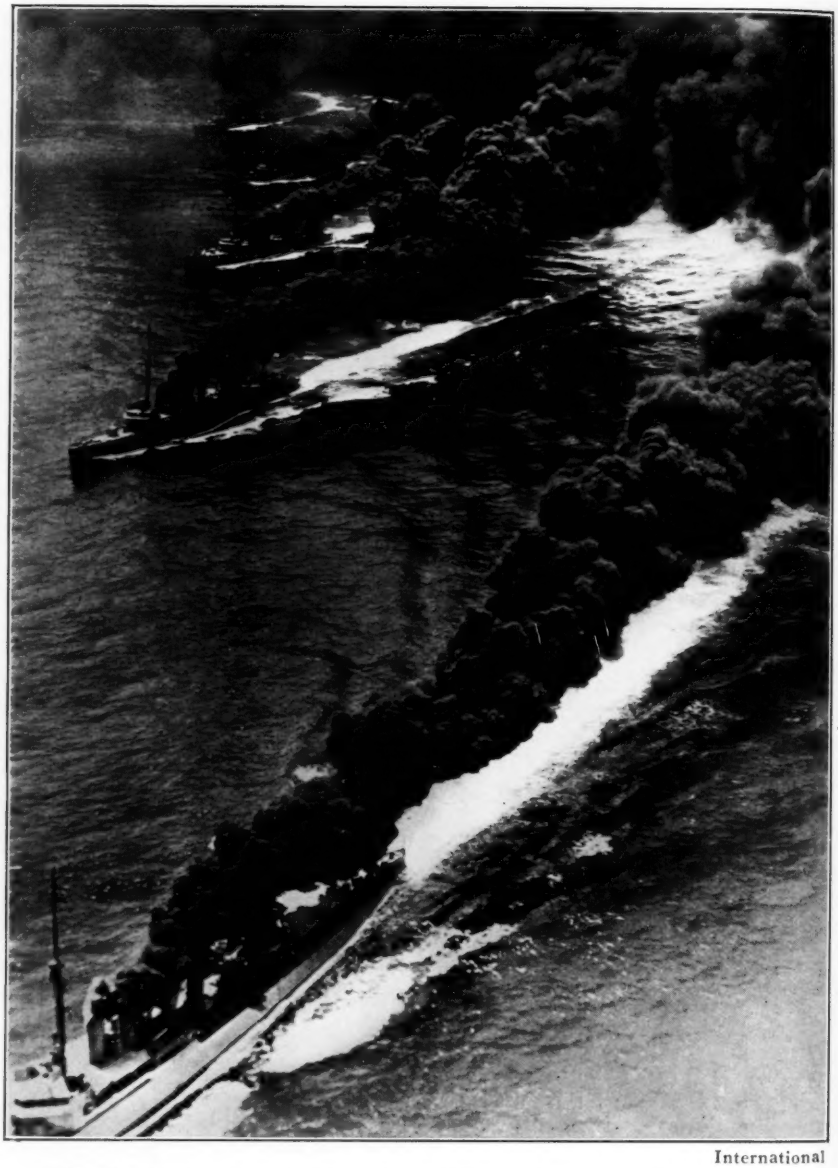

International

DESTROYERS DEFEAT DREADNOUGHTS IN SHAM BATTLE OFF AVALON, CALIFORNIA.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

A CAPTAIN TO HIS CREW

By CAPTAIN REGINALD R. BELKNAP, U. S. Navy

The following extracts from "The Big D Log," the weekly paper of the U. S. S. *Delaware*, were published during the winter and spring of 1920. At this time the personnel of the navy was at a very low state. Demobilization, high cost of living, high wages outside, and general unrest had taken away so many of the older men that the proportion of new, inexperienced and very young in our crew was unusually large. From her first year of commission, 1910, the *Delaware* had made a fine record for shooting, steaming, and general efficiency. She was one of the always reliable and, through good management being usually ready for whatever might turn up, she was lucky enough to get into many good things, including service with three other American battleships in the Grand fleet in the North Sea, beginning in December, 1917. With this background, the *Delaware* began the 1920 winter training in the West Indies, the oldest among eight battleships. Towards compensating for the great shortage of experienced naval men and with a view to dispel the apparent advantages of the newness and later improvements of the other ships, it was endeavored through a page in the weekly paper, signed by "The Captain," to make the men realize that the man's the thing that counts and to convince each man that his help was important in keeping up the ship's former high standing as a live member of the fleet.

Every Man's Interest

It is an old navy saying that a ship is known by her boats, and this is as true to-day as it ever was, but there are also other outward appearances by which a ship's general condition is judged—the behavior of her officers and men on shore, her signaling, and the attention paid by individuals to the looks of their ship as seen from passing ships and boats.

Keeping ships together stimulates pride in ship-keeping. It is an inspiring sight, when a smart ship stands into anchorage—everything shipshape alow and aloft, crew alert, all hands interested in doing it well. But only one man leaning on the rail instead of standing at attention, or lounging in a gun port, or sticking his head out an airport—any such thing the rival ship sees and it spoils the picture.

Ship's boats have occasionally figured in international incidents. The gig of the U. S. Cruiser *Yorktown,* over 20 years ago, while waiting for the captain in a foreign port, was attacked by a crowd of roughs. More recently, at Tampico, the *Dolphin's* gig was interfered with by local authorities. In all such cases, the behavior of the crew becomes especially important, to uphold the dignity of their ship and flag, at the same time giving no cause of offense, which might aggravate the situation. While among only our own kind, little occurs outside the ordinary, but we should never, on that account, let ourselves forget that boats represent the ship, nor let boat duty slack down, lest we be caught untrained or careless when the test comes.

In navy life, the unexpected often happens. Naval forces are continually being sent to places of disturbance, to restore or maintain order or to assist in some local need. In such circumstances, the behavior of the crew comes all the more into view. Two battleships suddenly left Guantanamo Bay one day several years ago, to assist in feeding and policing the earthquake stricken people of Kingston, Jamaica. Then, one night at Port of Spain, Trinidad, the crew of the old *New York* policed and put out a large fire on shore. Instances of guard duty in local revolutions are too numerous to mention. In one, where the railway system of a whole country was tied up, our naval force soon had it running again.

When men are on duty, whether on board or ashore, there is something or some one at hand as a reminder, but also when not

on duty, we still represent our ship and the navy, particularly on shore. Our navy has traditions extending back nearly 150 years. Much is expected of naval men, and happily they are continually adding to the reputation of their uniform.

Walking one Sunday in Potomac Park, Washington, I saw a man struggling to move his car, parked at the roadside. Dozens of men passed by without lifting a finger. Then my wife squeezed my arm, as four sailors, chancing along, took it all in at a glance, boosted the car out into the road and went on their cheerful way. "Sailor men, every time!" my wife said.

In a foggy and windy night on Long Island Sound, an elderly lady, making her first trip by the Fall River Line, became very fearful, as the boat heaved and creaked and the whistle blew repeatedly. Her daughter tried to calm her but the elder lady refused to go to her room, even to go inside. A naval petty officer, happening to overhear, said: "I am a navy man, ma'am, and know that there is no danger now, but if there should be, I will look out for you myself. I will come to your room and see you safe ashore." He was at once so sympathetic and sensible, the elder lady first consented to go inside and then, upon his taking the number and location of her room and again reassuring her, she retired with complete confidence.

So, let every man who wears the uniform remember to wear it worthily, whatever happens. The navy's record is not made only by a few but by the great majority, to which every man, no matter what his rank or rating, should elect himself to belong.

Remember, We're Americans

From every war, some words come down to us which were the utterances of officers or men under the stress of battle or in a tight place, and such words are treasured and carried along to remind us what stuff our predecessors were made of. From our War for Independence, 140 years ago, we have, for instance, Paul Jones' words, with his ship on fire and sinking, "Surrender? I have just begun to fight!" From the War of 1812, when our young navy made a world reputation, Commodore Perry's message after the Battle of Lake Erie, "We have met the enemy and they are ours." From the Civil War, Admiral Farragut's "Damn the torpedoes! Go ahead!"

There will be several sayings of this kind often repeated from the war just over, and one which deserves to be well remembered came from the U. S. S. *Mount Vernon,* Captain D. E. Dismukes, U. S. N., Commanding, on the occasion of her being torpedoed by a submarine off the coast of France. It had been well impressed on the crew that it would take more than one torpedo to sink the *Mount Vernon.* In one of the lower compartments a number of men were seated at mess when the ship was struck. There was a spontaneous rush for the door, which was natural enough on first impulse, since it was the only way to get on deck. But a petty officer sprang before the others and held up a hand. "Remember we're Americans," he called out, "and there was only one torpedo." Instantly all signs of scrambling haste disappeared, each man going quietly and deliberately to his station and, as we know, thanks to her training, discipline, and cool leadership, the *Mount Vernon* returned to port safely, earning commendation for her entire crew.

"Remember, we're Americans!" is a good motto for always. Our navy has had a great deal to do with making the word American mean what it does in the world, and it is for us of the navy to-day to do all we can to keep that meaning up to the same standard as in the past, and strive to carry it still higher.

On the ship's flying West Indian trip last December, when we changed uniform so quickly from overcoats to whites, there was one incident that may be mentioned here not inappropriately. When the second day of strenuous watches in the hot firerooms came around, with only a scant breeze giving but little cool air below, one of our new young firemen, scarcely heavier than one of the coal buckets he was to handle, passing the Chief on his way to the fireroom, said cheerfully, "This time, Chief, I expect to pass out, but I am going down there just the same."

A man of such stuff, of course, will not pass out. He has too strong a spirit. When there is work for him to do his one thought is to do it, because his own self-respect demands that all the work assigned to him shall be done well. No slacking, no loose ends, no easy excuses, least of all, no quitting—rather die first. Read all the history that is written and you will find that is the real basis of what has made the reputation of American naval men. Not just to get by with it, not to pass the buck, not to let George do it—but to be always on the job, to put it across, and to aim to lead the procession.

Man Overboard

With another trip ahead of us, between Barbados and Colon, we may wonder whether, this time also, there will be occasion to pick up a man overboard from another ship. Such an event affords a good test of a ship's organization and discipline, showing whether her men are able and ready on the instant, night or day, to make a real rescue. Always provided no harm comes to anyone, such practice as we have had, now three times within a month, is the best kind of training. Action in a real emergency is what tells.

In these days of so much motor boating, the art of pulling a good oar is not so common as it should be. But it takes more than good oarsmen alone to effect a rescue. Careful but rapid lowering, getting the falls and lines properly clear and the boat away from the side, good steering, keen lookout and helpful signaling from the ship, and then safe hoisting—all these are equally necessary. In a word, there must be a good *crew* both in the ship and in the boat. Every man connected with the life-boat should do his best to become skillful in every part of his duties, from the cry "Man Overboard!" until pipe down afterwards.

Remember that in lowering a boat we stake 14 lives to rescue one. As yet we have had only smooth weather. When wind and sea are up, one must think twice before lowering. Very often it depends upon the skill of the men on board whether the decision must go for or against the poor fellow in the water.

When steaming in formation in bad weather, a man dropped from any but the rear ship may sometimes be picked up by one of the ships following. This happened once in 1908, the fleet being on the way from Manila to Japan. It was blowing a typhoon (Chinese for "great wind") and the sea was far too heavy to think of lowering a boat. A man washed off the deck of the *Minnesota* was seen by the *Vermont*, next astern, which steered for him. He caught a line over the bow and came on board before his loss was known by his own ship. Quick work! But don't count on it. You may be in the rear ship, or something may prevent your being seen.

It may be of interest to mention something of the shore life-boat service. Our home coast is well provided with life-saving stations, each manned by a keeper and crew, usually nine or ten all told. These are maintained by the United States Government. Along the south shore of Long Island, a stretch of about 100 miles, there

are 28 such stations. On the Massachusetts coast there are in addition some stations maintained by that state. On the coasts of Great Britain the life-boats are maintained by voluntary contribution to the British Life-boat Association. During the period of the recent war, although sea traffic was much less than in normal times these British life-boats rescued men from shipwrecks, a few at a time, to a number sufficient to man a dreadnought battleship.

These rescues that the *Delaware* has actually made should bring it home to every man of the seaman branch that, suddenly, it may be up to him to save a shipmate's life. Now is the time to do a little thinking about it. Imagine yourself the man in the water, unable to reach the buoy, or just holding on with strength fast failing. Every second the boat can save counts. Next, imagine your own feeling as a member of the crew, if the boat arrived too late. Then imagine it when, by the crew pulling every pound that was in them—through knowing how—the man is reached just in time. Only honest individual effort and good work will do that. Bear all this in mind at boat drill and it will seem more worth while.

Stand Up to It

A writer in a small monthly paper called "Gems" says: "Why is it that we hang up on the chapel wall the soldier's sword but never hang the yard-stick up? There is nothing discreditable in the yard-stick. It is altogether honorable; the man uses it for his own sake. When he takes the sword, he is willing to give everything, even life itself, at the call of the country, and get nothing of this world's goods in return. The sword, like the cross itself, is honorable, not as an instrument but as a symbol of sacrifice."

Many young men and boys enter the navy in a spirit of adventure, undertaking whatever seamy side there may be as a matter of course, not realizing what the hardest of hardships may prove to be. Bad weather, cold, discomfort, long hours, and hard knocks generally will be taken in good spirit. All share them alike. The real test is in each man's regular day's work. To stand up to this faithfully, week in, week out, never slighting the details even when so familiar as to be irksome, forms the sacrifice in every life.

Sacrifices are made to gain what cannot be bought in the ordinary way but must be worked and sweated for. No boat race, ball game, rating badge, good target score, or other success ever comes without persistent, personal effort at the sacrifice of ease and leisure.

Sometimes it is the ship that celebrates the success, some times it is a man's friends or his family who find satisfaction and benefit in the result of his efforts. But when a sacrifice is thrown away, no one can feel satisfaction, and it certainly is sacrifice thrown away when, by neglect or slight of some minor duty, an otherwise promising man fails to make good.

We should bear in mind that the great satisfaction which we may take in any kind of success comes from the pleasure it gives to our particular friends on board and to folks at home. They, as well as the ship and ourselves, benefit by our faithful efforts, and the thought of them should stimulate our sense of duty. For their sake, if not for duty's sake alone, one should go at his work promptly and vigorously. To do the work cheerfully in this spirit gets it off one's chest quickly and always makes it seem smaller, because it is so soon out of the way—done.

In battle and excitement no effort or risk may seem too great. The blood is up and a man feels on his mettle. But to stand up faithfully, day after day, to a duty that seems insignificant and easily omitted, is a much harder requirement, because tedious and never-ending. In every case, remember who are behind you, interested in what you make of yourself. They always wish you success and in most cases they expect it. One may count upon sympathy and understanding when failure comes in spite of honest effort, but not so when a man quits. That is the very last thing his people expect of him.

In one of the engagements of the Franco-Prussian War of 1870, the Prussians were getting the best of it and were killing all they could reach, giving quarter to no one. Some distance behind the French line, at the entrance to a small village, stood an old French woman whose only son, all that she had in the world, was in the fight. Scanning each fugitive that passed by, she stood there quietly, gazing along the dusty road towards the front, all through the long, fearful hours. With the waning light of afternoon, the sound of firing slackened and the stream of escaping men grew thin, and thinner, and ceased. Darkness fell on an empty road and all was silent. And then, turning after one last look, she cried out: "Thank God! he did not run away."

Visor Up

The hand salute, which passes when members of the naval and military service meet, originated in the days of Knighthood, many

centuries ago. A knight in armor, with helmet on and visor down, covering his face, could not be easily recognized and when two of them met it was customary for the stranger or the junior to raise his visor. The other knight would immediately raise his visor, which corresponded to a return of the salute. When helmets were off, no raising of visors was necessary, just as we do not salute when the head is uncovered. Knights in armor have long departed, but that custom of theirs remains in use, as the military and naval salute all the world over.

Another heritage from the knights is the narrow commission pennant, flown at the ship's main truck. An old-time ship that flew a "Knight's pennant" was thereby marked by the State. She was thus distinguished from other vessels, engaged in private pursuits, which might or might not be lawful and honest—often they were not, from our point of view. When a ship flies an Admiral's flag instead of her commanding officer's pennant, it is a similar survival. The Admiral's flag—which we speak of as a personal flag in distinction from the national ensign—corresponds to the silken, embroidered, gilded, or otherwise gorgeous banner or standard which, in the Middle Ages, marked the presence of a personage of higher degree of rank and authority than a knight.

Knights were authorized—one might say, commissioned—fighting men, just as men-of-war are commissioned fighting ships. On being authorized to bear arms, knights took oath to act always honorably and in righteous cause, never to use their power to do wrong or injustice. In other words, they swore to be clean fighters and to support order and right, which the State ever stands for. So to-day, members of the army and navy, on entering, swear allegiance and obedience, to uphold the laws, the honor, the safety of their country.

The old knights and their customs were the best of their day. They lived and fought for the general good and safety, not for their own gain, and they were always careful to observe the rules and customs of their order. Their place has been taken by the army and navy, but the principles remain the same, and such of the old customs as still survive deserve our cordial observance. Customs do not come down through a thousand years unless they possess real value.

The hand salute belongs to the Services. Outside they do not do it just right—watch them and see; it is not quite natural. But

with us it is the recognition sign of our own kind, for all grades alike. The youngest recruit and the oldest captain make the same salute to an admiral, and he makes the same return to each of them, to captain, lieutenant, and apprentice seaman. Respect and courtesy work both ways, and all ranks and ratings stand on the common ground of sworn upholders of the law and order, the honor, and the safety of the State. Some people think of the salute only as a mark of subordination, but it means much more than that. As the silent password of a great body of men devoted to the service of order and right, it signifies the respect and good will necessary for proper team work, implying a sense of the common bond which unites high and low together in worthy, unselfish purpose.

The history, traditions, and customs of Knighthood centuries ago and of the Navy to-day are marked by dignity, courtesy, and good will among all members. That is something which visitors to ships almost invariably comment upon and admire, the more so the longer they stay on board. Bear these things in mind in connection with the salute—its old historical origin, its same meaning to-day, and its full significance—which is as if you said, on meeting a strange officer, "I may not know you personally, sir, but I recognize you as an officer, and you may count on me to know my job and do it, should we ever serve together."

The Man's the Thing

In Great Britain's war with the black natives of Zululand in South Africa, about 40 years ago, although the British troops had the advantage of fire arms and modern army equipment, the black warriors, armed only with spears, kept their enemy's hands full and inflicted losses on them. The British soon found that the Zulus apparently neither slept nor rested. The slightest relaxation of vigilance brought in an attack; any incautious strayer or straggler never returned. By these tactics and the fierceness of their onslaughts, the Zulus so wore upon their invader that what the British had looked upon as an easy campaign soon took on a very serious aspect before it could be turned in their favor.

The Zulus fought to win and they understood the value of discipline and courage toward that end. To any sentry that slept on post the Chief awarded death, as a matter of course, and he was killed on the spot by a spear-thrust. Another custom was related to me by a British officer of that campaign. In one engagement a

certain band of Zulus were reported to the Chief as not having done well. After the fight was over they were summoned before him to answer the charge of cowardice. The Chief ordered them all to be stripped of their arms and shields and then lined up, unbound and free, before the assembled Zulus. A detachment of warriors was then ordered to attack them.

As the deadly spears brought down one after another, the unarmed and defenseless accused men stood motionless as statues, outwardly indifferent to the execution of their mates on either hand. The Chief with his counselors scrutinized them for any least sign of flinching. Seeing none, he ordered the spear-throwing to cease, satisfied that the cowardice charge had been disproved.

Such a test could be used only by savages, but among them the prevalence of treachery, superstition, and panic necessitated extreme measures to obtain high results. Zulu war-training taught men to fight unheeding of odds, and so they would wait in ambush motionless for hours, until some unwary step brought a victim, and with only their spears in hand would charge upon artillery, rifle fire, and bayonets, stopped only by death. It was a striking example of resolute spirit overcoming material odds, illustrating Napoleon's oft-quoted saying that the men's spirit is worth three times the material factor.

As Shakespeare said, "the man's the thing." The spirit with which he tackles his job is what we must look to for success. Fortune is a fickle dame, never won by faint hearts, any more than other fair ladies are. Obstacles and handicaps melt away, lions in the path slink out of sight, when fronted by a hardy resolute will.

Commenting on the winter's athletics, the Commander-in-Chief said that the *Delaware's* high standing in general excellence shows again that results lie with the men, whether the ship be old or new. Number one is *Arizona,* vintage of '16, the newest battleship present, and following close after her comes the oldest, our *Delaware.* Without her crew, a ship is but an empty, silent hulk. The men transform her into a thing of life, her spirit being their spirit. Said the Chief of Naval Operations on coming aboard, "The old *Delaware!* She has always been a good ship."

So, while on liberty you may rightfully let your chest out a bit and wear your *Delaware* ribbon with pride unsurpassed. Her name has been well upheld by her present crew, and you may with

truth assure your friends that, while other battleships may be newer, no ten-year veteran ever had such a record as *Delaware's*, especially as the fleetest of the fleet. Though not yet at the top, we are on our way.

P. S. And don't forget that the *Delaware* counts on your services promptly when your liberty is up. Especially you young ones, remember that you have now become important to your ship, and your "job awaits you there."

No Consolation Prize

In the fleet's winter athletic season, which finished with our departure from Guantanamo, the *Delaware's* high standing in general excellence was attained by salting away a few points in nearly every event. Many competitions offered points for second, third, and fourth places as well as for first, and so there was usually hope for some reward, by pulling hard, doing one's best clear through to the finish, even though outclassed for first place from the start by some other team or crew better prepared. Where so many compete, second, third, and fourth places are in reality winners over all the rest of the field. Though not the highest they are still winners. This is the only justification in a military service for giving any reward whatever for any place but first. These lower awards are given to stimulate competition and encourage sustained effort and to emphasize that a game is not lost until it is won. But where only two compete, there is no second prize, no consolation for the loser.

One sometimes hears, "Yes, they won, but we put up a mighty good game." Better let the winner say that of you, when you lose. When you say it of yourself, you are letting yourself down easy in defeat, an attitude that has no place in the navy. A navy must aim only to win, never a thought for second place.

Nelson said one day "If there were 11 sail and we took 10, being able to take also the eleventh, I would not call it well done." What a very superior ship that one would be in which this principle of Nelson's was lived up to all through! Another British admiral when urged by his chief of staff, after one success, to push the campaign with still more vigor and make a quick end of it by one big killing, replied "No, no; we have done very well as it is" and he let a great opportunity pass. Here we have the true expressions, one

of the ever winning spirit, the other of the complacent loser. In the navy, well enough is not good enough—only the best will answer. That is the only spirit to bring victory.

Every one of us, of whatever rank or rating, is in a daily competition which scores for or against the ship according as we do our parts. Each turret, each division, each gun's crew tries to surpass the others, but beyond that, in every line of duty, large and small, there is a higher standard by which the performance of duty is measured. It is a competition between you and the standard. Either you are forgetful, half-hearted or otherwise slack, and you fail, or else you do your work thoroughly well, and succeed. There are no points for halfway—except hope for the future, and hope counts only when followed by actual results. A high score in target shooting, a table of shining mess gear, a part of ship or gun compartment which the captain can't find anything the matter with, a trim and unscarred boat, a neat and tidy uniform, complete—all these things win points for first place. The hard work that goes before is like the training and practice of a boat's crew. The test of the whole ship comes at Admiral's inspection, at target practice, and at speed trials. The ship then gets only the points that her officers and crew have earned. A single lagging oar may lose a boat race. So in a ship, a weak man's work shows a loss to the whole ship. In contrast, the man who is steady, attentive, and alive at his work stands high with his mates, and his influence, as well as his work, helps the ship.

One of the chief signal quartermasters in the fleet wrote a set of "Signal Bridge Commandments" beginning, "When you go on watch, bring your *brains* with you." This applies equally all over the ship. Think what you are doing, bear in mind that it is the ship you are doing it for, and remember what the name of the *Delaware* stands for and has always stood for during 10 years in the fleet. On the Theodore Roosevelt calendar for May the motto is "Whatever your work may be, do it up to the handle, and when you have time, enjoy yourself in games and sport. If you are a real man, you will wish to do them well too."

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AMALGAMATION AS AFFECTING THE CIVIL ENGINEER CORPS

By LIEUT. COMMANDER P. J. SEARLES (C. E. C.), U. S. Navy

Among the numerous papers which have appeared on the question of amalgamation of the staff corps with the line, there has been but little mention of one corps which in itself is not directly connected with ship construction, or ship operation—the corps of civil engineers. It is the intent of this article to discuss the effect of amalgamation upon the line officers, and upon civil engineers, and the resultant effect upon the navy as a whole. The writer is of the opinion that amalgamation with the consequent attempt of line officers and civil engineers to perform reciprocal duties would not be desirable. The two professions are so different, and the work of both so varied that it is difficult to master one without taking thought of the other, and the attempt to combine both functions in one person or group of persons would inevitably tend to mediocrity in both.

By Navy Regulation, the Bureau of Yards and Docks has cognizance of the design, construction, repair, upkeep and operation of practically all public works and public utilities of the navy. While these do not quite include cabbages and kings, alleged to have been discussed by the Walrus, they cover a wide range, from aqueducts to wheels, dry docks to radio towers, and from dams to mules (not the same "dam" as commonly connected with mules). Practically all building work in navy yards, except shipbuilding, is carried on by civil engineers. (This does not, however, include shop manufacturing.) Buildings, railroads, pavements, wharves, dry docks, shipways, etc., are designed and constructed by the Bureau of Yards and Docks, which also handles care of grounds, janitorial service, chauffeurs, etc. The work is almost entirely of an engineering nature, and in order to carry it out

properly, the members of the corps should be civil engineers. There are certain exceptions to this in the case of mechanical and electrical engineers, who are more largely concerned with those particular branches, but in general civil engineering duties prevail, duties which are entirely different from those of the average line officer, and for which considerable education and experience are necessary for success.

The Bureau of Yards and Docks is of long standing in the navy, and with it have been connected some of the illustrious names of naval history, for, from its inception until a comparatively few years ago, the Chief of the Bureau was selected from the line. One point scored for amalgamation, you say? Not at all, for the corps itself was composed, not of line officers, but of civilian civil engineers. Men were employed, who before, during, and after their connection with the navy, made their names famous in the engineering records of this country. They were few in number, about half a dozen, not becoming officers, having no rank or official recognition, but merely accepting such positions while retaining their civilian status. They were stationed at navy yards where they had no military duties or connections, but were purely concerned with engineering projects. This situation lasted until the eighties, when, due to the efforts of Rear Admiral Endicott, the civilian civil engineers were commissioned, and were eligible for the position of Chief of Bureau.

To-day, the corps numbers 106 members, distributed throughout the various grades, and has an authorized strength of 115. The source of supply has been twofold: (1) Certain Naval Academy graduates have been selected, and after a two-year course at the Rensselaer Polytechnic Institute, have been transferred from the line; (2) other members have been commissioned who possess an engineering degree, have had 18 months' experience in construction work, and pass a professional examination. In only a few instances have line officers been assigned to civil engineering duty, and most of these were civil engineers by profession, and reserve line officers during the war. All of this leads to the question of the effect which would be produced by amalgamation.

First, the subject will be considered from the standpoint of the civil engineers. In general they are not qualified for line duty. The Naval Academy graduates have had certain line experience, and would be of some value on board ships. The writer, for

example, had three years of sea duty, ranging from junior divisional officer on a battleship, through division officer on a gunboat, to gunnery officer on a cruiser. This experience occurred from 1913 to 1916, but due to widely changed conditions, much would have to be learned in the event of future sea duty. Most of the Naval Academy graduates in the corps have not had the opportunity to keep acquainted with the late developments in fire control, marine engineering, etc., and while they may have kept up their interest in such subjects, they are, of course, years behind their classes in experience, and would remain behind for a considerable time. While their classmates have been learning and practicing line subjects, they have been learning and practicing civil engineering, and this naturally is not conducive to line efficiency.

The civilian appointees have, in general, had no sea experience, and their transfer to the line with line duty would necessitate their taking up an entirely new profession, in which, whether or not they had an aptitude, they would be far behind men of same age who had followed the sea for years. In an attempt to make a Jack of all trades, there probably would result an inferior civil engineer and an inefficient line officer. Both the Naval Academy graduates and the civilian appointees are now by profession civil engineers, and any attempt to change or modify their profession would result in a loss of efficiency. They have had several years in technical schools, and have had years of experience, and are neither desirous of nor qualified to jump into a new line of work. They are competent to perform their present duties, but might not be so successful in event of a change. And all who favor amalgamation must consider what place is to be occupied by present members of the corps, for it is not assumed that they will lose their commissions. The line must consider whether or not they want these men at sea. They are few in number it is true, but the ships to which they would be sent would be handicapped for some years, not because of a deficiency in the men themselves, but because they would be of little value until they learned a new profession.

From the standpoint of the line officers, somewhat the same situation occurs. They have had line education and line experience, and are neither desirous of nor qualified to change their profession. In order that they could successfully handle civil engineering problems, they would need a college course and some years of experience. At the end of this period they would go back to sea, behind

their classmates in line experience, would have to work twice as hard to catch up, and at the end of a tour of sea duty, their minds would be a jumble of both professions, with the result that they would be master of neither. How many line officers would take up civil engineering if under the conditions described? When shore duty arrived the energetic, active, ambitious men would prefer a post graduate course in some line subject; ordnance, radio, or the like; the lazy men would look for soft snaps instead of two years' hard study, and as a result the corps would be filled by men who had not made good in the line. At present, transfers occur when line officers feel or show an aptitude for the corps. If amalgamated, they would be replaced by misfits, and no one will dispute that the duties of the corps can be carried on better by the present staff of specialists than by the offcasts from the line. The best of the line would remain in the real line, the worst would infest the corps, with a result that a large portion of the shore stations would lose their present efficiency.

The point may be raised that under a new system, the present specialists will be retained for shore duty only. This will not alter the situation. The corps at present is of such strength that if all members were retained, only a few line officers could be used. These few after a tour of sea duty would be out of touch with engineering developments; just as mentioned before, a civil engineer cannot keep in touch with modern ship appliances. They would erupt into a developed organization, and by the time they had found a niche, it would be time for another tour at sea. Back and forth they would go, unlearning one profession to learn another and vice versa, until they would end by being master of neither. It would still fall to the specialists to carry on the work, under constant handicap of having to command or obey men of another line of work. How many navigators or gunnery officers would care to have as ship's executive, an officer who spent half of his time in the public works departments of navy yards, and how many commanding officers would care to have civil engineers as divisional officers? Similarly, how many commandants would care to have a good navigator as public works officer? In no case would satisfaction be assured, for neither profession could be thoroughly mastered. It is felt that at present the corps is efficient, for the men who compose it are able, keen and competent. The writer is not handing bouquets, for he attributes the same to the line and to

other corps. But ability in both endeavors can seldom be secured, and in event of amalgamation a loss of efficiency is certain to occur.

It is frequently argued by the proponents of amalgamation that while staff work is more or less specialized, yet the officers are mainly executives with the detail work handled by assistants, and thus the line officers having equal executive ability could equally well handle any department. This is only true to a certain extent. The civil engineers are both executives and specialists. For executive work, matters of policy, etc., in some instances but a slight knowledge of engineering is necessary. Routine paper work could usually be handled by any one. In these cases a line officer would be competent to act. But in a majority of questions that arise, at least a knowledge of the broad principles of civil engineering is necessary, and frequently a detailed expert's knowledge is essential. Not all design work is handled by draughtsmen. It is true that draughtsmen, aides, etc., put through a large amount of design, but all except the most simple plans are checked by a civil engineer. Very frequently the civil engineer is himself the designer of a structure. Very few members of the corps would entrust to a draughtsman the entire design of a dry-dock, complicated crane, or any other of a thousand and one things within a civil engineer's purlieus. Neither would a navigator rely on a quartermaster's sights. Assume a line officer with several years' sea duty after leaving the Naval Academy, two years in a technical school, and two or three more years at sea. Could he handle designing? And this, I emphasize, is essential. The civil engineer must be able to do himself, what is required in design from his assistants, and furthermore he must frequently actually do it himself. Line officers could issue orders but they could not be certain of their being carried out properly because they would not have the necessary technical knowledge to permit them to know when work is satisfactory. And how many would want to bear the responsibility of work over which they had no real control or knowledge?

One point which would occasion difficulty would be handling enlisted men and handling civilian labor. The writer has done (or at least tried to do) both, and is thankful that a change from one to the other is not to occur again. Each must be handled in a different way, and each presents its own special problems. A man may be an expert with one but hardly with both, and where a change is to occur every two or three years, trouble is liable to happen.

One has "esprit" and the other "union spirit," both excellent but different, and requiring different methods of approach. This is given as one of the more or less secondary problems to be met, although in some cases the success or failure of a public works officer depends upon the efficiency of his yard labor.

One of the points for amalgamation, not often mentioned, but much thought of, is, that it would send the shore going "waffle tails" to sea, and give the line officers more chance of regular shore duty. True. But this could be done in a more proper way, by making a line officer's shore duty strictly line business. Has the navy so many ordnance experts that the number of post graduate students in this subject could not be doubled? More inspectors of engineering material could be used. These two are mentioned as indication. Regular shore duty should certainly be assured, but why in a position for which line officers are not qualified?

One opinion, rather digressive, the writer would like to express. He believes that civilian appointees to the corps of civil engineers should at some early period be given six months to a year at sea in order that they may get acquainted with the line, discover and appreciate the line viewpoint, and in general find out what the navy is for and what it's all about. This would produce closer sympathy with each other's aims, and tend to more cooperation. This does not mean that civil engineers are to become line officers but merely that they may be imbued with the navy spirit and learn to belong to the navy.

A serious question arises in the problem of promotion if amalgamation occurs. Suppose a civil engineer with the rank of commander is due for promotion in the corps. He is compared with other men of his profession, and if qualified is advanced. But suppose he has spent 15 or 20 years in the corps, and is due for promotion immediately after amalgamation. He would be doomed, not because of any prejudice, but because he could not qualify as captain in the line. Also a present line officer who took up the specialization would lose. He would probably be passed over in favor of the all round sea going man. Rightly so, for the former would be mediocre, and the latter unhampered by years of digression would be an expert in his profession. Again I ask, what class of line officers would specialize? Only those who could not make good in the line itself. Sooner or later construction work would be carried on by misfits and offcasts with a certain loss of efficiency.

To-day the members of the corps take just pride in their work to an extent they could not approach if that pride were divided between two objects. One year proud of being public works officer; the next year proud of being first lieutenant; the next year proud of God knows what.

There is not on the part of any members of the corps a desire to exaggerate its importance or necessity. We realize that the line is paramount. Nothing is clearer than that "hits per gun per minute" is the essential of the navy and that everything else is secondary. We aim to serve the line and in doing so aid is not accepted always in the spirit in which it is given. "Ich dien" is the motto of a family proud of its position, and it might also be the motto of the corps, proud of its work. We serve, and ask in return due recognition that only by continuous and uninterrupted service can we continue our successful work.

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PRACTICAL LESSONS FOR THE AMERICAN NAVY FROM THE BATTLE OF JUTLAND

By CAPTAIN A. W. HINDS, U. S. Navy

Although thousands of pages have been written about the Battle of Jutland, no apology is needed from a naval officer in writing for a service magazine on this important subject if his writings clear up any obscure points in this most complicated battle.

Many officers, who spend a lifetime in military service, never take part in a great battle; fewer still ever engage in a sufficient number of battles to gain, from personal experience, the amount of strategical and tactical knowledge necessary to fit them for leadership.

Napoleon probably fought more battles than any other great general, and one might think he had enough personal experience to furnish the basis for his profound knowledge of military affairs—yet, while the world thinks of the great French Emperor as a military wonder, Napoleon attributed his marvelous success in war more to a good memory than to flashes of genius. At some critical point in a campaign or battle Napoleon merely had the good sense to apply a sound principle, already tried out by his predecessors, in the situations he found confronting him.

In the study of history pertaining to the naval profession we have to search through masses of detail to find important points and principles, just as Napoleon studied the history of Alexander, Cæsar and Hannibal for the maxims which stood him in such good stead in the many wars he waged in Europe.

Thousands of pages have been written on the life of the world's greatest seaman, Admiral Nelson. There is such a mass of Nelsonic history that those of us with poor memories read and forget—yet even those afflicted with the shortest memories gain, by reading the naval history of Nelson's time, a rough idea of the outstanding characteristics of the hero of Trafalgar, and find a few principles for use in modern war.

While the tactics and strategy of Nelson have been studied for over a hundred years, the Battle of Jutland is far more complicated than the whole of Nelson's war experience, and it will take many years of faithful study to prepare us to reap the benefit of all the professional data furnished by this great sea fight. No better indication can be found of the intricate character of the struggle between the British and German fleets in the North Sea on 31 May, 1916, than the great number of bridge and W. T. signals sent and received in the Grand Fleet during the interesting period between the late afternoon of 30 May and midnight of the following day. During this time the British fleet sent and received, on the average, a message every five minutes.

The importance of the Jutland Battle to the naval profession is accentuated by the fact that it is the only naval engagement in which practically all types of modern fighting ships were used. With the exception of submarines, every type existing at the time took part in the battle, and, if we consider the whole strategic plan of the commander of the High Seas Fleet, we shall see that even submarines were used. Sixteen of this type were in use during the operation, stationed off Scapa Flow, Moray Firth, the Firth of Forth and north of Terschelling Bank, and it is interesting to note that these undersea boats had, as one part of their dual mission, the supply of information to Admiral Scheer. A large number of dirigibles were to be used in observing the movements of the British forces, but under the plan, if reconnaissance from the air proved impossible, the U-boats were to be used as the advance scouts of the fleet. As it turned out the weather prevented the use of air scouts, and the submarines furnished to the commander of the High Seas Fleet at least three important reports of movements of British forces.

There is food for thought here. Where a submarine stands periscope watch, steaming so slowly that no " feather " is shown, or balancing and making no headway, the periscope is very difficult to see. If, then, the mission of the submarine is purely to gain information and it makes no attack to betray its presence, its use on scouting duty seems promising. Once discovered the value of the submarine in service of information will disappear, for destroyers will force it under and then its low speed will usually prevent it from regaining touch with the enemy fleet.

While on the subject of scouting, it seems rather strange that, although Admiral Scheer contemplated the use of dirigibles and actually used submarines for strategic scouting, no strategic scouting was done by the British fleet. Both the commander-in-chief and the commander of the battle cruiser fleet were informed on 30 May by the Admiralty that news pointed to early activity on the part of the German fleet, and later on, during the same day, received the following instructions: "You should concentrate to eastward of Long Forties ready for eventualities." The commander-in-chief then gave orders for the sweep to be made in the North Sea and appointed rendezvous for both the battle cruiser and Grand fleets at 2.00 p. m. the following day. The British fleet had 34 cruisers and 9 battle cruisers as opposed to 11 cruisers and 5 battle cruisers of the Germans. It seems that some cruisers at least could have been safely detached to scout against the enemy movement through the known swept channels leading out of Heligoland Bight, yet, no scouting was done at any considerable distance from the battle cruiser or Grand fleets. Was it feared that British scouts sent out well in advance would cause the High Seas Fleet to return to its base? Of course the American Navy has no scouts as compared to the other two leading sea powers, but we may have a well-balanced fleet in the future, so strategical scouting at a good distance from the main fleet is a matter that should receive consideration.

The writer is attempting to bring out only the outstanding features of this battle, so wherever events ran along in their normal course they will not be subjected to comment; we are trying to touch upon only the points worth remembering.

It will be convenient to divide the battle into the three phases into which it is usually divided and then, concerning each phase, ask ourselves this question—what can we learn from this part of the action?

FIRST PHASE. BATTLE CRUISER ACTION

The forces engaged in the battle cruiser action were:

BRITISH.	GERMAN.
4 Battleships.	No Battleships.
6 Battle Cruisers.	5 Battle Cruisers.
14 Light Cruisers.	5 Light Cruisers.
27 Destroyers.	32 Destroyers.

This part of the battle was a normal gun-action with the usual torpedo attacks by destroyers and light cruisers and with the normal fight to be expected between these types. Notwithstanding the great superiority of the British ships, the German battle cruisers suffered but little damage, while two British battle cruisers were sunk.

Admiral Jellicoe ascribes the rough handling of the more numerous British capital ships in this phase of the action to these advantages in favor of the Germans: (1) Heavier armor; (2) a better delayed-action fuse; (3) armor protection above the main deck. Others seem to think that lucky shots sank the *Indefatigable*, the *Queen Mary* and the *Invincible*. As the Germans kept sinking battle cruisers all the afternoon, it seems more like superior marksmanship on the part of the Germans than anything else. Those of us who are lucky enough to have had much experience in battleships realize how complicated the fire-control problem is. The absence of *one* officer or man may vitiate the whole fire-control drill. From our knowledge of the willingness of the Germans to work, it is not difficult to believe that they spent more time on fire-control drill in pre-war time than was spent in either the British or the American navies. Was not the better German shooting in the battle cruiser action the simple reward of more drill when preparing for war? If so the lesson is simple.

It is generally admitted that the Germans were ahead of the rest of the world in range finders at the beginning of the war, just as they were in advance of all other navies in the construction and handling of submarines. They had better optical instruments than the rest of us and, in consequence, they hit with more salvos early in the fight, than the British. The fleet that can land the first salvo has a marked advantage. The answer here is not so easy. There are two ways to keep abreast of other navies in any type of ship or in any kind of material. The first is to spend time and money in investigation and experiment; if the navy had the money to do this we would not admit that any other nation could excel us in anything—but the wave of economy sweeping over the country will leave the navy with little money for experiment for a number of years. The other way is to spend money to find out what other navies develop; we can never hope to do this, for the money spent would have to come from a *secret* fund, and the

average Congressman is not willing to vote for a fund where he cannot see " in black and white " what the money is spent for. For the remedy we must depend on our high naval officials in Washington and a Secretary of the Navy sufficiently strong to be able to convince Congress of the necessity for spending money both for experiment and for information as to the progress our possible enemies are making. These remarks also apply to the shells for our guns and, in fact, to all the material that goes into the makeup of any kind of implement of warfare.

THE MAIN FLEET ACTION

The first thing that strikes one on a study of this part of the engagement is that the battle fleet was 18 miles from the rendezvous made for it by the commander-in-chief for 2.00 p. m. on the day of the battle. Of course, hind sight is clear, yet there was every reason to believe the High Seas Fleet was out and, as this was to be a *coordinated* use of the whole fleet, had the commander-in-chief any right to be an hour's run from his own appointed rendezvous? The whole battle fleet lost an hour in the examination of trawlers, when another hour of daylight in the engagement might have brought quite different results. The lesson for us is to " stick to the plan."

" Be perfectly clear in your own mind what you want to do, and then carry it out to the letter."

The reports made to the commander-in-chief concerning the position of the High Seas Fleet were conflicting to a degree. In Admiral Jellicoe's report concerning his doubts as to how to deploy, he writes: " The conflicting reports added greatly to the perplexity of the situation, and I determined to hold on until matters became clearer."

The stumbling block of the British commander-in-chief was lack of accurate information. The damage done by the lack of this information was intensified at two points, first it delayed the deployment —second, later on in the action, the British battle fleet lost touch with the Germans because Admiral Jellicoe did not know the German fleet had turned away. The first lack of information cost the British a loss of 16 minutes, the second a loss of about 20 minutes and, as Nelson said—" Time is everything. Five minutes makes the difference between a victory and a defeat."

It is quite naturally a difficult matter for a ship to keep accurate record of her position, with reference to the flagship, during a hot engagement where there are numerous changes of course and perhaps even zig-zagging; but the results of Jutland show the vital importance of accurate navigation when approaching for battle and even when engaged. If the positions of reports are misleading, the commander-in-chief is hopelessly blinded.

The necessity for efficient tactical scouting, prompt and accurate reports and the charting of all incoming information seems to be far and away the most important of our lessons from Jutland.

The next event of importance on the British side was the "turn away" by the British battle fleet to avoid torpedoes. The "turn away" or the "turn towards" torpedoes to clear them is a thing that can only be decided by the commander on the spot. That no commander could be justified in entering a known torpedo area with capital ships is certain. The main point for us, however, is this—Admiral Jellicoe's light cruisers and destroyers were out of battle position when the torpedo attack was made on the battle fleet; they were out of position on account of the deployment and the four point turn to starboard (by divisions) to close the range. When we have built our light cruisers can we keep them and our destroyers in battle position when deploying the fleet or when changing direction in battle?

The other most interesting feature of the main fleet action was the three reversals of course made by the High Seas Fleet while engaged with the enemy. Our battle theory, up to the World War, was that such a thing would be disastrous. Even rank changes of course during a fight were to be shunned to avoid a "knuckle," danger from partial cap, and to keep clear from a further complication of the fire-control problem, too complex at best. In this connection zig-zagging was resorted to both by the British and the Germans in the battle cruiser phase of the action in order to derange the enemy fire delivery. Scheer's reversals of course under protection of a torpedo attack by his destroyers and smoke screens from these vessels show how incorrect were our old conceptions as to the danger of making a rank change of course while under fire.

Our lesson from this part of the battle will come from a closer study of smoke screens. The commander-in-chief will need to have handy for use on his plotting sheet some kind of a smoke diagram

giving the resultant form of the screen with the wind at various angles with his course, taking into account also the speed of the smoke screen layers and their distance from the battle formation. I believe it safe to say that much experiment is needed along these lines.

THE NIGHT ACTION

The official dispatches of the Battle of Jutland show the last flag signal to have been made at 9.30 p. m. 31 May, and the first hoist next morning at 2.30 a. m., thus giving the duration of darkness.

This phase of the battle again shows the necessity for accurate knowledge of all ships' positions with reference to the rest of the fleet. The sketches made from a study of the battle data by Lieutenant Commander Frost show—(1) High Seas Fleet generally west of the Grand Fleet at 9.30 p. m., distant about 10 miles; (2) head of High Seas Fleet about west-northwest of the British battleships at 10.30 p. m., distant about 7½ miles; (3) by 11.30 p. m. the High Seas Fleet bore about north-northwest from the British battleships, distant about 9 miles; the German fleet was now heading off to the eastward, crossing Jellicoe's track (well astern) and at 2.30 a. m. the High Seas Fleet was about 30 miles north-northeast of the Grand Fleet.

The Grand Fleet was fairly well concentrated with the light cruisers and destroyers in general about 5 miles astern, and the battle cruiser force about 15 miles off to the westward. The High Seas Fleet, according to a track chart signed by Admiral Jellicoe, was badly scattered; the tracks of the *Westfallen* battle squadron, *Deutschland* class, and the *Kaiser* and *Konig* squadrons are 5 miles apart. It is inconceivable that, when the relative remaining strengths of the two fleets are considered, the British commander-in-chief did not desire to renew the action at daylight on 1 June. The opportunity to renew the action was probably lost on account of lack of information—possibly the information that came in from contacts was not promptly and efficiently charted for use of the commander-in-chief. It seems *most probable* that if the information of contacts had been promptly plotted, the general course and speed of the High Seas Fleet would have developed early enough so the British fleet could have still interposed at Horn Reef between the Germans and their base. The German fleet was

about 17 miles west-northwest of Horn Reef light ship at daylight on 1 June.

Our lesson from the night action is that tactical information must be given promptly and accurately and that it must be plotted quickly and correctly; the work of the plotting party may spell victory or disaster.

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OFFICERS FOR SHORE DUTY ONLY

By CAPTAIN E. P. JESSOP, U. S. Navy

Glittering generalities, like epigrammatic utterances, quite frequently by their apt expression carry far more semblance of truth and basic fact than analysis will bear out, and, as a result, those who seldom analyze or are not interested particularly in the subject discussed, accept such utterances at their face value and thereby blind themselves and those whom they influence to the realities of the case.

Such a condition, it appears to the writer, is shown by the service's placid acceptance of essays and articles having to do with specialization. That the subject is vital to our future success in a naval way seems not to have seriously disturbed the even tenor of our thought, when in reality there is no more important subject for our earnest consideration to-day than our attitude toward specialization and the methods which should be used to accomplish our needs in that line.

The pro-specialists seem to be on the increase in the service, although they still are in the minority, and no one would seek to discourage them utterly but only to control them and guide their footsteps so as to give us the kind of specialization that will be of real use and not act merely as an augmentor of corps or class animosities and disagreements.

None of the articles which have so far appeared have attempted to describe what kind of specialist is needed for naval use, and while it is probable that each of the writers had in the back of his mind some idea of what kind of a specialist he was talking about, it is not without the bounds of possibility that such an idea was in a very vague state, which would account for a great deal of the indefiniteness and lack of instructive information in the various papers.

When the term "specialist" is used, one has in mind an individual who knows more on some one subject than the average indi-

vidual who has to use the particular art in his business. In other words, it indicates a particular knowledge where the average individual has only a general knowledge. Therefore, in our service, it has been our habit to designate certain individuals from among the younger generation to take certain designated postgraduate courses to form a foundation for various specialties. These schools include courses in naval construction, electrical engineering, steam engineering, and ordnance.

The selection of young men for these various postgraduate courses, with the exception of those selected for naval construction, is rather loosely made, since the young men designated are permitted to apply for the designation, and the appointments are made from these. The average young officer, who is ordinarily bright and passingly energetic, can get sufficient recommendation from the officers with whom he is working to make a fair showing as to his fitness for appointment to the postgraduate course. Frequently, however, and quite properly, the number assigned each year to postgraduate courses is much greater than the number required to fill any particular specialist class which the service might need, so that a weeding out of the less fit is always possible; but it is questionable if much weeding out is done.

Having completed the postgraduate courses, all the graduates except those assigned to naval construction are sent to sea, and they, from then on, have recurring terms of sea and shore duty until they come to command rank, when, if they have applied and been assigned for engineering duty, they are relegated to "engineering duty on shore only" for the rest of their natural lives, unless they happen to be ordered to sea as fleet engineers. Those who are given a postgraduate course in ordnance do not have this "for shore duty only" tag applied to them, but, quite the reverse, they continue up through the ranks doing their recurring terms of sea and shore duty.

As is well known, the naval constructors do not go to sea after their appointment to the postgraduate course, except as they are called upon to go on trial trips or as attachments to the admiral's staff of the fleet.

It does not appear to the writer that such procedure can, with the wildest stretch of the imagination, be expected to produce the kind of specialists which the navy is in need of. There would appear to be two basic reasons for this: (a) The navy is approxi-

mately 75 per cent an operative and 25 per cent a building and repair problem. (b) Specialists who depend upon their work for a livelihood, and the monetary return from whose efforts fluctuates with their ability to please their clients with their work, are usually amenable to a suggestion from those who have to operate the product of their especial training; in other words, they meet the conditions imposed by their clients as far as it is possible to meet them.

Considering the first reason, due to the fact that the navy is to such a large extent an operative problem, the relegating of our specialists in construction and repair and our specialists in engineering to " shore duty only " is, to say the least, a peculiar method of maintaining specialists for our purposes. While appreciating that the construction corps of the navy seems to honestly believe that a constructor can learn little by recurring tours of sea duty, yet it is difficult to see on what they base any such belief. It is notorious that a ship turned over from the builders to the operating navy is practically never complete and is almost never completed. In other words, there is a great deal of evolution in arrangement and in equipment which goes on from day to day and the necessities for which are made evident by observation. Consider, for instance, the item of ventilation in ships. The ventilating system is designed, laid out and installed by the construction corps, and supposedly, theoretically each compartment of the vessel received its proper amount of calculation, and the amount of ventilation provided supposedly bears proper relation to such computation. That vessel is put into commission and taken to sea, and from that time on, 75 per cent of her time is spent in operation, and sea-going conditions immediately suggest changes. The ventilation as installed does not do what the calculations stated it would do. Recommendations are made for these changes, and it has been our experience, and it is not believed that the constructors themselves will question this, that the acceptance of such recommendations has in most cases been slow, and in many very notable cases the recommendations have not been accepted at all.

The same thing is true of all other items on board ship for which the construction corps is responsible, whereas if each first-class ship had a naval constructor on duty on the ship in any one of several capacities, he would be a representative of the Bureau of Construction and Repair, whose special training in naval construc-

tion would so strengthen such recommendations as to cause at least a fair percentage of them to receive proper attention.

In the realm of engineering we are rapidly approaching the same condition, as we are building up a corps of engineering officers who, upon arrival at the approximate age of 35, cease to be ordered to duty with the operative navy, as they are then tagged with the " for shore duty only " label.

In ordnance only do specialists continue to go to sea and take part in the evolution of their art, because it must be admitted by the most skeptical that it is the operations at sea which force evolution in the various arts which make up ship operation. Our specialists have not the incentive to receptiveness from outside experience and suggestion that the specialist in civil life has. Their livelihood is in no way influenced by their attitude toward the sea-going personnel and its ideas. They may in fact be just as obstructive, high-handed and dictatorial as they please under ordinary conditions, and experience has shown that they do tend to become just that wherever anything like a corps is concerned. It should be quite unnecessary to dwell on this point if the average officer had studied corps systems and their effect on military or naval service, and in order to point the way to light on the subject, a study of the following is recommended:

(a) Condition of naval ordnance prior to 1899.

(b) Condition of naval engineering prior to 1899.

(c) Condition of army ordnance up to and through the World War.

(d) History of naval construction to date.

(e) Relations between the army engineers, ordnance, and artillery corps as affecting the efficiency of the artillery arm, and particularly that of the coast artillery.

Such a study, of course, must be made with the idea in mind of discovering how far the corps system is a basic reason for any inefficiency which may be found to have existed in these various activities. It will be noted that the activities mentioned in the army organization are those which have to do with the building and operation of artillery equipment, including emplacements, location of magazines, shell rooms, hoists, etc., and which correspond to our construction engineer and line corps in their relation to the ship.

It will be found that our naval ordnance was of such flimsy construction and so inaccurately built as to make it almost useless.

It will be found that our engineering departments on board ship were in a deplorable condition, although each ship had a number of specialist engineers to operate the machinery.

It will be found that army ordnance was far behind the times in design, greatly below par in weight of metal thrown in a given time, and deplorably slow in production.

It will be found that our naval constructors were behind hand in developing under-water hulls whose performance at sea could be considered in any way as approaching satisfactory results, and that for years we had been laboriously pushing ahead of us the water which was only too anxious to get by, and we had been likewise for years gravely calculating the necessary horsepower to drive hulls at a given speed only to find when we actually drove the hull at the designed speed that the horsepower necessary bore no relation to that we had calculated.

It will be found that the Engineer Corps of the army designed and erected the emplacements for our coast artillery; placed magazines far from the guns they were to serve; placed ammunition hoists of an antiquated type at an unnecessary distance from the guns to be served, thus preventing any attempt at rapidity of fire. That the Ordnance Corps designed and built the guns and mounts with practically no attention to suggestion from artillerists of long experience; provided slow and antiquated methods of loading and handling the mechanism long after the navy and foreign gun builders had brought their guns up to date, and as a crowning achievement accomplished the feat of so redesigning the French 75, which had stood the test of four years of war, as to prevent the arrival of a single battery of American built 75's at the front before the Armistice.

These things were true, not because the individual personnel was not up to the work, but because basic organization requires that in any combination of design, construction and operation, where the three are essential parts necessary to produce one definite result, they are too intimately connected and too interdependent to admit of separate control by three different units or agencies where one agency (the operative) is alone responsible for the result, and where the others can and do in such frequent cases load what should be their meed of responsibility on the former's shoulders.

An objection will undoubtedly be registered against the inclusion of naval ordnance under the head of corps, but the writer is con-

vinced that the methods pursued by the Ordnance Bureau during the years immediately prior to the Spanish War made what was practically a corps out of the Bureau and its activities, in that the Bureau became a self-perpetuating body with a permanent head, with the result that it had all the mystery and obstruction of the other corps, and this mystery and obstruction retarded naval ordnance evolution immeasurably. Nothing but a tidal wave from the sea-going personnel could have broken it up. Fortunately, we received the impulse for such a tidal wave from Admiral Sims' introduction of the Percy Scott method of training, and the condition of naval ordnance was quickly shown to be far behind the necessities of actual battle conditions. This rejuvenation of naval ordnance forced an awakening to some extent in all other naval lines of endeavor, and this was notably the case with naval architecture, with particular reference to the changes found necessary to protect handling rooms and magazines from fire dangers due to explosions in turrets; and the lack of knowledge of the necessity of this change by the British constructors seems to have accomplished the destruction of three battle cruisers of the British fleet in the Battle of Jutland.

This is a glaring case of the necessity of specialists seeing with their own eyes the results of their arrangements. Had the British constructors seen what happened on the *Missouri, Kearseargе,* and *Georgia,* they would not have placidly sat down as they did, saying "That poor American powder," and have sent three such death traps to sea as the battle cruisers proved to be.

A greater change in an engineering way had previously been made when the Engineer Corps was legislated out of existence by the Amalgamation Law of 1899. In ordnance we had no law in the way of opening up the Ordnance Bureau to outside influence, and, therefore, the Sims agitation was all that was needed for that, but it is a practical certainty that if we had had an Ordnance Corps established by law, the improvement in ordnance due to the efforts of Admiral Sims and other sea-going officers would not have had anything like the same impetus given it.

The ostensible reason for doing away with the Engineer Corps was to do away with the antagonism which had grown up between the line and engineers on board ship, for it was realized that the ships could not be really efficient when such disruptive conditions existed. There was no realization at that time that engineering in

the service was at a very low ebb, and it was not until the results of having a mutual ground from which to view the ships' efficiency as a whole began to make the various activities on board ship show in their true perspective in their relative importance to the ship's efficiency, that the evil effects of the corps system became really evident.

In this discussion, the corps which have to do with the building, operation and repair of the fleet are the only ones considered, thus eliminating the Medical, Supply, and Civil Engineer corps as unnecessary to the discussion. The relation of the three corps mentioned is of a nature which has so little effect on the general design, construction, operation and repair of the ship as to make it unnecessary to consider them.

The fact that we were able to show up the condition of our naval ordnance by the Sims method does not assure us of being able to do likewise with other corps, because after all the personnel of the Ordnance Bureau was made up of sea-going officers, who had merely lost some of their open-mindedness through being returned each recurring shore duty to their old positions in the Bureau, and who, through the peculiar kind of loyalty they thought they owed to ordnance, whose chief had been a fixture for 12 years or so, had that much incentive to be intolerant of suggestion from those who had not the inspiration which exists in the atmosphere surrounding the chief of the corps.

In other words, line officers in ordnance had much less of a gulf between themselves and the " run of the mine " line officers at sea, than was true either in the case of the Engineer Corps before it was abolished, or of the Construction Corps up to date.

Again, it must be stated that we did not abolish the Engineer Corps because it was not efficient as an engineer corps but because its continuance meant constant friction on board ship and the consequent lowering of the all-round efficiency of the ship. In this we succeeded in accomplishing our purpose, but we at the same time introduced a new element, that is, " Officers for engineering duty on shore only." The reason for this separate designation was that the older officers in the Engineer Corps were not required to qualify for the line, and those who did not qualify were placed on the " shore duty only " list. This arrangement at the time was, of course, necessary and quite proper, but it also placed a small foundation stone in the naval organization upon which could be built a practical Engineer Corps without designating it as such.

In 1916 such a corps was established by a clause in the Naval Appropriation Bill of August 29, which authorized the formation of a list of officers " for engineering duty only," who, after reaching the rank of commander, would, with the exception of fleet engineers, be " Officers for shore duty only." The proposition was not a service proposal in the sense that the service generally had been consulted, nor was it a service proposal if a majority of the service could be considered as having any right to a knowledge of what legislation was being considered with relation to the service personnel. It was entirely a star chamber proceedings as far as any service need or desire was concerned, and was, I believe, diametrically opposed to the general idea in the service at that time.

Coincident with the above, another much more serious proposal was prepared to be urged on the secretary. This second proposal amounted to a division of the line of the navy under two headings: (a) Officers for Command; and (b) Officers for Industrial Duty. The text of the proposal was such as to cause any officer who read it to believe that his chances to command ships at sea would be sadly jeopardized if he were seen to glance at a monkey-wrench or other industrial implement without openly manifesting the greatest aversion to it, in that it stated that any officer who accepted duty in the industrial side of the service on shore, should by that act be relegated to the list of industrial officers, and could not thereafter be considered eligible to command. Fortunately for the service, a few officers who knew that a knowledge of the machinery which operates the ship was a necessary part of the naval officer's equipment, and who at the same time could tell the difference between a jib and a topsail, got wind of the affair and by vehement expression of opinion were able to have the proposal consigned to the oblivion which it deserved, but the point to be remembered is that such a revolutionary proposal, fraught with such far-reaching effect on the whole service, could have been seriously prepared for submission to a civilian secretary, who could not have sufficient knowledge of the naval game to appreciate what the effect would be, and this proposal was prepared by an officer of such high rank and of such position in the departmental organization as to give his proposal all the earmarks of service need and service approval.

This proposal, if acted upon, would have divided the service more completely into two corps than it was divided in the days of the

old Engineer Corps, and would have engendered in the service the same old antagonisms which made our ships inefficient in the time prior to amalgamation, greatly augmented, however, by the outraged feelings of hundreds of officers who have carefully trained themselves in both the industrial and the upper deck sides of the service, in the belief that a knowledge of the mechanics of the ship is essential to proper decision on the bridge.

To-day we have a clause in the Navy Regulations which prevents officers who have taken the postgraduate courses in engineering and who have been assigned to the list of " officers for engineering duty only " from taking command of a ship when all others in authority above them are out of the ship, and already we have the beginning of heart burnings caused thereby and a tendency of the younger officers to look askance at following their natural desire to know about the machinery which makes the fighting of the ship possible. The above regulation, of course, refers only to those engineer officers who are designated as " officers for engineering duty only," but it is not beyond the bounds of probability, and in fact, is certain to happen, that one of the junior engineer officers who is not designated " for engineering duty only " will be left in command of the ship over the senior engineer officer who has been so designated. A more dangerous situation from a disciplinary standpoint could not well be imagined.

As to the importance of the senior engineer officer in the activities of the ship outside of his own particular department, there should be no question. His assistance in caring for and increasing the efficiency of the mechanical part of the ordnance game on board ship alone makes it essential that the closest kind of association and coordination be maintained between himself and the ordnance officer, and such sympathetic coordination would appear impossible if we are to separate him from a participation in all the functions which go with the rank he holds.

The members of the old Engineer Corps who did not qualify for line duties are rapidly becoming very few in number, and with their passing goes the only real reason for distinction being made between officers of the line, regardless of what course their duty may take, and we should abolish the " shore duty only " iniquity.

The fact that the engineer officers of the younger generation were able to qualify for the line duties has proven conclusively that going to sea in regular order is all that is necessary to keep an

energetic officer in touch with all departments of the ship, regardless of what duty he may be performing in the ship, and when it is remembered that we now have quite a number of ships whose purpose is to a great extent industrial, the solution of sea duty for those of too exalted rank to make it proper to assign them as engineer officers of ships, and who still desire to follow comparatively exclusively the engineering game, seems in our hands, for certainly the commanding officer of a repair ship, if the ship is to be efficient, must be an officer who knows the intimate details of operative, engineering, and the repair game, and should have the most vital interest in them.

A specialist in the navy to be really successful must not only have a postgraduate course but also must have practical experience on the operative side of the game, and this practical experience must be spread over the whole period during which the particular individual can safely be considered by the service as a specialist. This is true because of the rapid evolution in the naval profession, which evolution makes a back number of yesterday.

The above mentioned practical experience must also be general experience and not just confined to the narrow limits of his specialty, because it is the general conditions surrounding his specialty, or rather surrounding the use of the product of his specialty, which have the determining effect on the success of that product in the service. Herein lie the real reasons for the sea-going element insisting on the requirement of sea service for our specialists, whether they be constructors, electrical engineers, marine engineers or ordnance men.

It is easy to cite instances illustrating loss of touch with operative conditions by "officers for shore duty only." One is as follows:

In one of our large ship yards there was an inspector of machinery, who was probably one of the best of the old school engineers. One of his assistants, a sea-going officer, objected to the boiler installation on a vessel which was building, for very definite practical reasons, which reasons, however, would not have been true if the boilers had been Scotch type instead of water-tube type. The inspector said: "I have never had experience with water-tube boilers, but I will take your word for it," and the changes advocated by the young officer were made. The inspector had been an officer "for shore duty only" for about 10 years, and in that time had so lost touch that he had to take the advice of an officer

who had, as compared with him, very limited enginering experience, merely because "for shore duty only" had prevented him from keeping up to date from an operative standpoint.

Another illustration of the necessity of experts, or specialists, acquiring an intimate knowledge of operating conditions to permit them to properly do their work is as follows: At a meeting of the Naval Consulting Board, where the matter under discussion was the location of the Board's experimental station, a note was written to one of the Board by a naval officer present, saying that the plant should be located near one of our large seaports where it would be more easily accessible to officers who sent in suggestions, in order that they might assist in the development of their ideas by their practical experience. The answer he got was: "All we want is for the navy to tell us what they want to accomplish and we will give them the answer damn quick."

The same member of the Board later became interested in a naval problem and failed utterly to make any headway until a young naval officer was sent to work with him to answer his questions with regard to conditions and antecedent experience in the same line.

The ship is so much of a unit that everyone in the ship, and in particular every officer in the ship, has a complete running knowledge of the activities of all departments, and it is a matter of history that one of the greatest assistants in the evoluion of equipment for proper training in gunnery in the early days of Admiral Sims' epoch-making crusade was a sea-going paymaster, and it is further a matter of history that by far the greater number of the improvements in naval ordnance at that time and since have been initiated at sea and pushed to satisfactory conclusion by practical sea-going officers.

While on this subject, it might be stated that it is exceedingly probable that had the first-class ships of the navy each had a naval constructor attached to it, the improvement in stream lines of battleships would have been made very much earlier than was the case, as they would have had daily and practical demonstration of the remarkably inefficient stream lines of all our battleships up to the evolution of the dreadnought. It is true, and it must be appreciated, that the everyday occurrences on board ship in all lines of endeavor are the guides by which future improvement in construction, arrangement and equipment of ships to do the work for which

they are designed must be based, and it is believed that any constructor who went to sea from day to day in vessels of the *Wyoming* class and who observed the motion of the vessel when being driven into a heavy head sea, would immediately be interested in evolving schemes to reduce the whipping tendency of the bow after it had buried itself solid to No. 2 turret. His tendency to investigate the possibilities of a fuller bodied forward section to reduce pitching, and at the same time not to reduce the speed elements of design, could not but have been more earnest than if handled by him merely as an academic subject.

The fear is always expressed that the time necessary to gain practical experience in the use of the product of the specialist, while a good thing, would prevent him from being a specialist on account of lack of time in one short life to collect the necessary knowledge to both design and operate any particular product. This, to be frank, is plain and unadulterated poppy cock. The caliber of brain which will be of use as a specialist will have to delve into many outside arts and sciences in order to keep itself properly warmed up and operative, and the operative side of the art affords the opportunity to improve as nothing else can improve the resultant output of such a mentality.

The truth is that many more weaknesses in any structure develop in use than develop on first test. When they develop on test, the builder of the structure sees the test and immediately remedies the defect, but when such defects develop in service it is frequently next to impossible to make the designer believe that it is not the crass ignorance of the operator rather than the weakness of the structure which is at fault.

On the other hand, given a certain piece of equipment which is designed to do certain things, turn it over to the sea-going personnel and have them report against it for certain defects; if the specialist has had practical experience with that particular design of equipment, he is in much better position to put his finger on the seat of the trouble, whether it be carelessness on the part of the operating forces or inherent defect in design, than he would be without such experience, and if it be the fault of the operating force the specialist will have much less trouble in clearing up the fault than would one who had no practical experience under conditions of operation and is known by the sea-going personnel to have had no such experience. In other works, one is much more liable to accept the dictum of a specialist when he knows that the specialist has had the same kind

of practical experience as he himself has had, than he is when he knows that the opposite is the case. The kind of naval specialist who does not have experience with the operation of the product of his specialization cannot but become a stumbling block to progress and a theoretical parasite on what is a problem 75 per cent of which is practical.

In all the above, the writer holds no brief for the line, because what has been said of constructors and engineers would be just as true of a line officer who insisted on sea duty only. Good professional duty on shore at intervals is just as necessary for the seagoing officer as terms of sea service are. Fortunately, we do not have many officers who make the mistake of remaining always at sea, and especially is this true at the present time when rotation in duty is more or less required by the Bureau of Navigation.

There has been a cult in the line of the service who have rather systematically refused to take their turn on duty in connection with the material side of the service, for the same reason which is taken to bolster up the supposed necessity of "officers for shore duty only," that is, the lack of ability of one brain to know thoroughly all sides of the service. These officers blind themselves to one element in naval life which makes it different from that of many civil occupations, and that is the fact that the whole navy is trained and operated to one particular end, efficiency in battle, and in moving from one organization to another the basic system of the new organization is similar to the old. Each new occupation to which the officer is assigned has some coordinating link with that which he has just left. His basic education, not only at the Academy, but in general service in his association, necessarily close on board ship, with all the activities which go to make up ship life, cannot but be general, and as long as he goes to sea at recurring intervals, cannot but keep him more or less up to date on the changes, not only in equipment but in method, without impairing but on the other hand increasing his efficiency in the particular activity in which he may be temporarily engaged. It takes nothing from his opportunity to think upon and study any specialty to which he may be inclined, but rather energizes his thought to the enlargement of application of his specialty in coordination with others to increase the general efficiency of the ship for battle.

There is no profession in which conditions change more frequently and in which requirements increase more rapidly, both as

to equipment and method, and to properly meet such changes and requirements an intimate knowledge of the operative side of the service is the first essential, and such intimate knowledge cannot be acquired without recurrent duty in the operative service.

An officer returning to shore duty from sea should have at his finger tips the results obtained in the use of his specialty aboard ship, and his ability to do this should not have been impaired by his assignment to other duties than those of his specialty if he is properly energetic and has the interest in his work which is a prerequisite of the true specialist, because it must be thoroughly realized that interest in certain lines of thought and endeavor, and not education, is what makes the true specialist. Education in special lines increases the ability of the individual in those lines only when this interest is present, and his limitations then are measured by the energy he possesses to drive him on.

Daily life on board ship brings to the attention of inquiring minds thousands of small ways in which the design of the ship or her equipment could have been improved; a door should have been cut here and not there, hatches here and not there, doors to swing inboard here and outboard there, ventilation here should have been thus and so, this arrangement is all right in port when so and so is true but is impossible at sea, etc., *ad infinitum*. Take these to the " for shore duty only " officer, and what do you get? " There appears to be no real need for these changes, etc., also *ad infinitum*.

This would not be so serious in many cases if the " for shore duty only " officer would put the item down where it would for a certainty be considered by competent authority when the next ship was being designed, but this he does not do because he personally has never had experience with the particular item which would stamp it on his memory as it is stamped on the memory of the operative personnel.

A case in point: An assistant inspector of machinery, just from sea, found on his first inspection of the firerooms of a ship that was building at one of our best shipyards, that the valve stems of all main and auxiliary steam lines were pointing downward. Investigating as to why this condition should be so universally true, he found that it was because the original type drawing giving simply the general arrangement of the machinery in sufficient detail to permit bids to be made by contractors, had all valves indicated with stems down. He also found that a ship just completed at the same yard had had the same situation and the stems had been turned up

afterwards, by the contractors, at great cost to the government, but no notation was made at the time in the drafting room to prevent a recurrence of the error, which error would have been instantly picked up by any competent operating engineer who had not been kept away from the operative side of the service by the " for shore duty only " mark on his record.

The memory of man is short and full of inaccuracy and in a profession where evolution never sleeps, memory, however tenacious of things of yesterday, cannot be of prime use in things of to-day, and is just one step farther removed from things of to-morrow.

Failure to appreciate the needs of fast flying evolution caused by operative requirements, obstinate refusal to recognize improvements when suggested by those who inhabit the less rarified atmosphere of the operative world, obstruction, procrastination, and ultimate ossification of the whole system of naval activities, will be the sure result of such a segregation of specialists from the " run of the mine " naval service.

This tendency of the present is all the more astonishing when one looks back on the quite recent war and the practical result of naval operations of our own service based on the general service idea, and of others based on the segregation idea. In whatever light one may view it, if the basic idea of the efficiency of the ship, which after all is the unit from which we work, be considered, one is inevitably forced to the conclusion that the corps system wherever it touches the operation of the ship is an utter drag on efficiency, and that any specialization which does not expressly feature operative experience rather than technical education and design, is a serious perversion of a proper naval perspective.

Any engineer officer of the army who was on duty at the front during the war will state emphatically that he found he had to have an intimate knowledge of infantry and artillery tactics and strategy in order to permit him to do his proper part in the operations with any measure of intelligence since his work made the movements and tactics of the two other corps possible, and what is true of the army is in no measure less in the navy, but is rather increased by the isolation incident to sea going.

To recapitulate:

Naval constructors should be amalgamated with the line for the following reasons:

(a) By segregating them into a corps and assigning them to shore duty exclusively we lose the benefit of their trained minds

on board ship in the almost daily conferences of the officers to increase the efficiency of the ship for battle.

(b) They lose the opportunity to observe constantly the points in which design, construction and equipment can and should be corrected to meet the rapid march of evolution, and they lose the incentive which the spirit of the ship inevitably imparts to greater endeavor to achieve excellence in their part of the game of preparation for war.

(c) They lose all the incentive which being in line of succession for command inevitably gives, and in addition they cannot but feel the soreness which comes from not being eligible for the highest and most satisfying position in the service, that of commanding units of the fleet and in time the fleet itself.

(d) Isolated in their work, they become intolerant of suggestion to a greater or less degree, and therefore frequently obstruct where they should assist development.

(e) Passing from one position to another on shore means only physical change of scene and environment, the association being a duplicate of that just quitted, and the work usually exactly the same. Such a life cannot but tend to discourage effort and lead the mind into narrow lines of thought which inevitably limit efficiency.

(f) Questions of promotion, precedence, and jurisdiction which at the present time are so irritating would be entirely eradicated.

(g) The number of officers assigned to postgraduate courses in naval architecture could be made commensurate with the needs in those lines instead of being, as is now the case, held to a certain number.

(h) The service would gain the continuous use of this specially selected class of mental attainment for general use in solving service problems instead of curtailing its use to the narrow limits of naval architecture, and at the same time the ability of these minds would be increased by broadening their field to include the operative side of naval life.

All other specialties which have to do with the building, operation and repair of the fleet are in the same category, and it follows that the abolishment of " for shore duty only " among constructors and engineers is an essential to increasing service efficiency, and while it will undoubtedly be opposed by some, the service would do well to look with care at the true reason for such opposition.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

SEA SCOUTING

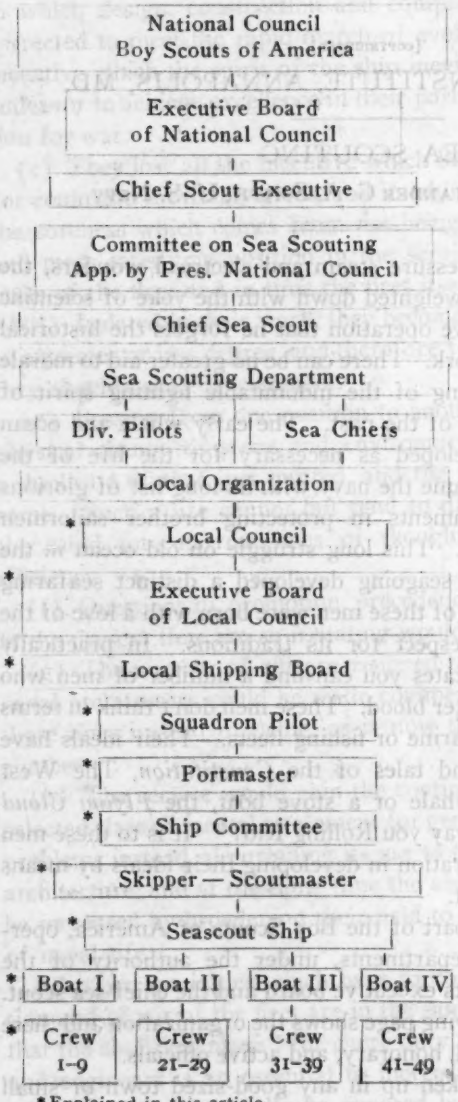
By LIEUT. COMMANDER G. A. SMITH, U. S. Navy

In this age of high pressure steam and electrical wonders, the average naval man is so weighted down with the yoke of scientific organization, and intensive operation that he forgets the historical component of his life's work. There can be no greater aid to morale than a clear understanding of the indomitable fighting spirit of the American sailor man of the past. The early whale and ocean carrying trade was developed as necessary for the life of the struggling nation; then came the navy with its long list of glorious victories and accomplishments in protecting brother sailormen and dependent industries. This long struggle on old ocean in the early days of American seagoing developed a distinct seafaring race, and the descendants of these men were born with a love of the sea, and a wholesome respect for its traditions. In practically any city in the United States you can find a number of men who are proud of their salt water blood. These men don't think in terms of the navy, merchant marine or fishing fleets.—Their ideals have grown from thoughts and tales of the *Constitution*, The West Indian pirates, a dead whale or a stove boat, the *Flying Cloud* and the gold fever. "Away you Rolling Rio!" It is to these men that the navy owes cooperation in developing their ideals by means of the sea scout movement.

The Sea Scouts are a part of the Boy Scouts of America, operated just as all other departments, under the authority of the national council through its executive board and the chief sea scout. The diagram on the following page shows the organization and there are also listed the national, honorary, and active officials.

Sea scouting can be taken up in any good-sized town or small city. It will be seen from the diagram that in starting sea scouting, the start is made with the local council. As boy scouting has been

DIAGRAM OF NATIONAL B. S. A. ORGANIZATION



OFFICERS

Honorary Pres.
W. G. Harding.
Honorary Vice-Pres.
Woodrow Wilson.
Wm. H. Taft.
Daniel C. Beard.
Wm. G. McAdoo.

Pres.—Ch. Livingstone.
Vice—Milton A. McRae.
Vice—B. L. Delaney.
Vice—Arthur Letts.
Vice—Robert S. Thorne.

Chief Scout Exec.
James E. West.

Com. on Sea Scouting,
Geo. W. Goethals,
Chairman.

Chief Sea Scout,
Geo. A. Wilder.

*Explained in this article.

established throughout the United States, the local council is already in existence and may be expanded as necessary to handle the additional work which sea scouting imposes.

The scout executive, who is secretary of the local council, issues a call to members of the council to meet in the interests of forming a sea scout organization. The council meets and the executive board of the local council is empowered to start the movement.

The local sea scout shipping board is made up of and operates under the executive board. The shipping board consists of three or four men who are interested in the navy and marine matters and who may be counted on to attend meetings fairly regularly and push sea scouting.

The squadron pilot is the local boy scout executive, his other duties are active secretary of the local council and secretary of the shipping board.

The portmaster is a citizen of salt water blood or sea-going experience. He is the chairman of the shipping board.

The scoutmaster or "skipper" is the mainspring of the organization. He must be an experienced seaman. A navy recruiting officer, a retired officer or reserve officer, a retired boatswain or gunner, a retired member of the merchant marine, or a yachtsman. The skipper plans the work, executes the work, and brings the ship to practical efficiency.

The sea scout ship consists of one or more boat crews with nine men in a boat crew. The crew numbers are from one to nine, and are billeted as follows: Coxswain, messman, yeoman, baker, signalman, waterman, handyman, shipsmith and sailmaker.

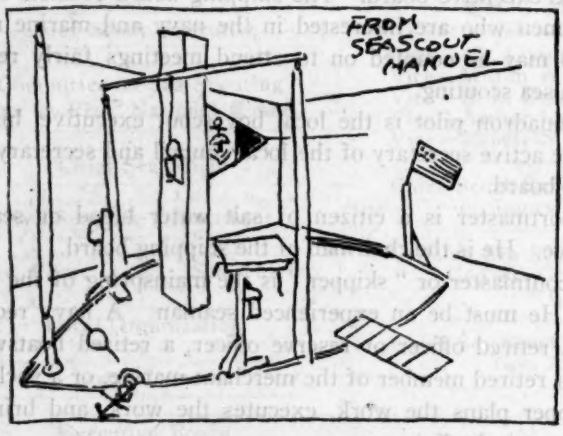
The local council approves of the program of seascouting and the shipping board, pilot, portmaster, ship committee, and skipper are ready to begin work.

The ship committee is composed of the same members as the shipping board, until a number of sea scout ships have been organized, when the ship committee is formed to look out for the interests of the individual ships.

A good-sized room or small hall is secured, and invitations are issued to all boy scouts, 15 years of age, or over, weighing at least 112 pounds. The time, place and date of the first meeting are specified. At the first meeting the plans for the local ship are discussed and names of volunteers listed. All volunteers are

registered as apprentice sea scouts. The shipping board applies through the local council to the national council for charter for the ship, and upon issuing the charter the skipper is commissioned by national headquarters.

The hall is converted into the deck of a ship. The following equipment must be provided before the next weekly meeting; sea-scout ship flag, Seascout Manual, Bluejacket's Manual, small ensign, ship's bell, old running lights, small amount of canvas, palm and



B. S. A. SLOOP "THEODORE ROOSEVELT."
Built in one evening in the basement of the house where John Hancock was born.

needles, marline, manila line, thread, compass, barometer, thermometer, jackstay, fids, broom, bucket, lantern, old steering wheel, blackboard and chalk. Having secured a small amount of gear and lots of pep, the ship is ready to be launched and sail forth on the seas of good fellowship, citizenship and seamanship.

The most difficult part has been accomplished and from now on the Seascout Manual supplies the sailing directions by which the ship is steered. Turning through the pages the skipper finds the following work to be done:

SCHEDULE OF WORK

The *Sloop Class* work is the first work to be accomplished and is the class that allows the boys to get acquainted with one another. In this class come many things already known to the first-class boy

scout; signalling, first aid, compass—but there are many new things, and review is always beneficial. It is in the winter that the following sea training takes place:

1. The mariner's compass—simple principles and boxing by whole points.

2. Make a hardwood fid 8 inches long, and 1 inch wide at base, sand paper and oil.

3. Make a three-strand eye, back, and short splice. Make a grommet. Using a palm and needle make the following stitches in a piece of canvas; round flat-overhand and herringbone. Whip the end of a rope with needle whipping.

4. Know the meaning of the following bos'n's orders: "All Hands"; "Up All Hammocks"; "Mess Gear"; "Sweepers"; "Pipe to Mess"; "Away Running Boats"; "Side Boys"; "Haul Away, Hoist Away, Belay."

5. Become familiar with following types of small boats: Punt, catamaran, balsa, wherry, dory, dinghy, "Clinker," "Carvel" and "Diagonal" builds. Scantlings and fittings of small boats; cutters, sloops.

6. Anchors, bower, sheet, stream, kedge, mushroom, sea anchor, grapnels, chain cable, swivels, shackles.

AT CAMP, or when boats are available:

7. Sleep in the open or under canvas six nights.

8. Learn parts of an oar and commands for boat under oars; "Stand by your oars; shove off; out oars; stand by to give way; give way together; feather your oars; in bow; lay on your oars; up oars; let fall; trail oars; hold water; back water; point the oars; pull a dry oar."

9. Blocks—made, mortised, snatch, gin, secret, two-three-fold.

10. Rules of the road.

11. Buoys.

12. Barometer and clouds, swimming and life saving. It will be seen that this schedule, allowing one subject for each weekly meeting, will consume from four to five months. When this work is completed the boy is a real sea scout, is a practical little sailor, and wants to absorb more sea knowledge. After a thorough examination each boy is issued a certificate showing him to be "an ordinary sea scout."

The *Schooner Class* having qualified as an ordinary sea scout and having a minimum strength of 18 men in the ship, the next step

is to actually sail and row on the ocean, lake, pond or river. This work is not as comprehensive as that of *Sloop Class,* and can be accomplished in from six to eight weeks.

1. Draw compass circle. Draw outline of ship and name the ahead to astern bearings by points. Describe the liquid compass; dry compass.

2. Sketch the following type of vessels: Schooner, brig, bark, ship.

3. Make three trips in a pulling boat covering 10 miles. Prove knowledge of orders and boat handling.

4. Sea scout ship etiquette, discipline and ceremonies.

5. Make a sea bag 30 inches long and 10 inches in diameter. Make a three-strand tapered eyesplice and worm parcel and serve the same. Make a chain and a long splice.

6. Drill by sections from scout " Manual of Drills."

7. Learn the Beaufort scale.

8. Reeve off a luff tackle, mouse a hook.

9. Anchors, cat and fish falls, deck stoppers.

10. Make models to demonstrate rules of the road. Anchor lights for sail and steam vessels.

11. International code flags and storm signals.

After a thorough examination each man is given a certificate showing him to be an able sea scout.

When the sloop and schooner class work has been successfully accomplished sea scouting is on a firm basis. This work should not necessitate over six months. Therefore when organized in the fall, the crew of able sea scouts are ready when summer arrives to embark on a real cruise. Boats can be obtained from the Navy Department, and sails can be made in case some navy bos'n is available to help the work along. Complete schooner rig sails, with spars for the Syracuse sea scouts were made at a cost of $50.00 (two outfits). These two cutters will serve for other sea scout ships that may be organized. When the boats are equipped a cruise is planned and the real joy of sea scouting begins. A camp site on some nearby lake is selected and the shipping board makes plans for establishing camp. Each scout must pay about 60 cents a day for his food. All arrangements being completed, the skipper and crews embark and establish camp. It is the ideal vacation for the young American,—sailing, watch duty, swimming, woodcraft, rowing, and physical drill.

The next step in sea scouting is the barkentine class:

Barkentine Class.—The barkentine class work is the next to be undertaken by able seascouts. A small part of this can be given in camp, but the major part will come when work is resumed in the city headquarters.

When the men qualify as able sea scouts they automatically become barkentine class sailors. As has been previously explained, six months during the fall, winter and spring is sufficient to take a green hand through sloop and schooner classes, so that all belong to the barkentine class when the cruise starts.

1. Show by models the rules of the road for large steam vessels.
2. Make and mark a hand lead line, "dipsey lead."
3. Make a chip log; sketch a patent log rotator.
4. International code flag signals.
5. Charts, variation and deviation.
6. Make a square topsail "flatten down", "let fly", "reef."
7. Reeve off a twofold purchase.
8. Make model of life-boat capable of being released. Use of oil during heavy weather.
9. Marlinespike seamanship from Knight's *Seamanship.*
10. Make a one week's cruise in a small boat and submit a 500-word log.
11. School of the troop—"B. S. A. Manual."

After a thorough examination men are given a certificate showing them to be extra sea scouts.

The next steps are *Bark Class* and *Ship Class,* but as sea scouting in the United States is still in its infancy, these will not be described here. This article is written with the hope that readers will become interested in the sea scout movement and, if occasion permits, personally lend a hand to some nearby struggling sloop or schooner class.

WHAT SEA SCOUTING MEANS.—Sea scouting like all boy scouting, has as its paramount objective "The development of sound patriotic, moral and physical principles in the great army of future citizens, now known as Young America."

The scout oath is:

On my honor, I will do my best:
1. To do my duty to God and my Country, and to obey the Scout Law;
2. To help other people at all times;
3. To keep myself physically strong, mentally awake and morally straight.

Boy scouting is coming into a high state of development throughout the United States. Thousands of troops are working and turning out good citizens and good thinkers. Generally speaking with boys from 12 to 15 years of age the results have been wonderful. It is for the boys over 14 years of age that sea scouting was started. The interest of this class of boys cannot be kept with straight scouting when the dance hall, pool room, and "do-nothing evenings" begin to exert their influence. Sea scouting is helping to fight these influences by providing healthy work and amusement that will put boys in the employable class.

At the present time a great many qualified and highly trained boy scouts are being lost to the scout movement. A successful sea scout organization is the answer to this loss of boys. Sea scouting is struggling for its life. Trained men are needed for its development. The recruiting service of the navy is ideally situated to render effective help without any complicated orders, extra details, or one cent of additional expense. The only thing necessary is to have the recruiting officer and a boatswain or gunner devote two or three hours a week to help develop a strong scout ship in the city in which the main recruiting station is situated. With a strong ship in the larger cities, many ships in the smaller cities can be developed. Retired or inactive navy men can be looked up to handle the smaller ships. The work is interesting and it is work that helps the government at all times.

The World War has left the navy with no strong naval reserve organization. The American Legion is absorbing thousands of navy men in posts where it is mostly all army and army deeds. The wonderful work of the Legion is not questioned in the slightest, but if "The race o' sailors is dying out" it is high time that the navy and merchant marine devote a small amount of time and thought to the development of the "American sailor of the future." The second line of naval defense is assured when the possibilities of sea scouting are realized.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

PSYCHOLOGY AND THE NAVAL OFFICER

By LIEUTENANT F. H. GILMER, U. S. Navy

All mankind, except imbeciles, are capable of being properly designated as belonging to one of three classes. The classes are "the thinker," "the director" and "the doer." Regardless of how a man scales by a mental or psychological test he can properly be assigned to one of these three subdivisions of mankind. This does not mean that a man of the thinker class can do nothing other than think; nor does it mean that a man of either of the other classes is restricted to that type of functioning indicated by the class name. It does mean that the thinker is better qualified to think than he is to "direct" or to "do." It is possible to assume, with a fair degree of accuracy, that the thinker is capable of better thought than the "director" or the "doer." The same reasoning holds equally well for the other two classes. Briefly expressed this only means that any one man is better fitted for some one position than for any other position and that he is better fitted for that one position than most other men.

The navy is a large and complicated organization. Large enough to require a certain number of officers of each type. So large, indeed, as to necessitate the proper recognition of the type to which each officer belongs, and the distribution of work so that each officer is performing that sort of work consistent with his type.

In the past and at present the navy has completely ignored this fact and as a result all officers, with the exception of a few specialists are doing general duty. This is detrimental to the service because as a result many officers are occupying positions which some other officer is better qualified to fill and is failing to occupy the position for which he is best qualified. This necessarily results in a dual decrease in the efficiency of the navy.

It is also detrimental to the officer, for he is judged by his performance of a duty for which he is not temperamentally suited. Furthermore the present system of promotion by selection has introduced an additional unfairness into the situation; because a man who by chance is in his proper niche receives recognition of

his good work, while no one stops to realize that the misfit might do equally as well were he placed in his proper billet.

If each officer were made the subject of a short and yet thorough psychological research immediately after, or at the time of his graduation this condition would be effectively remedied.

This research or examination would serve a double purpose. It would first determine whether or not the candidate's four years of preparation had left him properly equipped to be qualified as officer material. It would then show to which of the three classes the officer belonged and the results should be used as a guide in the assignment of that officer to certain specific duties.

We will consider briefly the three classifications and endeavor to divide the several positions in the navy into corresponding groups.

The thinker is a man who is mentally alert. He is capable of sound thought but is not particularly fitted to direct the work of others; nor is he strongly inclined to put his thought into action. Officers of this nature are well qualified to occupy positions in our naval diplomatic corps, to act as instructors at the war college, and to write books on the higher calling of our profession.

The director is a man who is not inclined to great thought, but is able to direct the work of the doer so as to materlize the thoughts of the thinker. In connection with this, the idea, that a leader or director—for fundamentally they are the same—must be able to do everything better than any man he directs or leads, is not sound logic. The director must know only enough to assure his being able to distinguish between work properly done and work improperly done. The director must have the additional ability of selecting the right man for the right job. Officers coming under this classification should be the chiefs of our bureaus, the captains, executive officers of our warships, and the heads of our departments.

The doer is the man who when properly directed will exert much energy in the performance of his duties. He is, in the final analysis the "backbone" of the navy. The doer is generally the possessor of mechanical skill and to him we should detail the duty of attending to the upkeep and development of material. The doer is an able subordinate though seldom capable of assuming the duties of high command.

Briefly summarized—there are three types of mankind. All three are requisite to the service. The efficiency of the navy depends upon the proper assignment of the men. How?—is the question. Psychological examinations—the answer.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

OVER SEAS EXPEDITIONS

By COLONEL EDWARD L. KING, U. S. Army

During the past year the Naval War College at Newport, Rhode Island, and the general service schools of the army at Fort Leavenworth, Kansas, have cooperated in the solution of a certain number of problems involving combined operations of the army and navy. The problems themselves were of a simple character, entirely abstract, and covered by relatively few of the many details that such operations must, from their very nature, entail. While a casual reading of the problems and the several solutions might disclose only these few details, a closer association with them brings prominently to the front many others.

As the army member of the Staff of the President of the Naval War College it has been my privilege to cooperate in the solution of these problems and I have been impressed with the large field for research and study that they open up.

While the recent war has not altered the principles of warfare to any appreciable extent, it is well recognized that the introduction of modern weapons has decidedly disarranged many previously held ideas as to the exact methods by which these principles shall be applied. Much more exact information is necessary than was formerly the case and much more detailed plans and more fully developed team work must be recognized as essential than was formerly the case. Both the army and navy recognize this fact in their own spheres. For combined operations, team work is certainly essential and the difficulties of obtaining this desired team work seem at present decidedly hard. Careful study by each arm of its own duties must be made, a more than smattering knowledge of the needs, power, and limitations of the sister service must be secured, and then a study must be made with a view to fitting and joining the two services; a welding at the points of contact so as to secure a resultant that brings out the maximum effort of each service toward securing the desired ends. Officers of both services

who have given the matter thought are convinced of the necessity for consideration of this form of military work.

During the World War the army and navy were brought more closely together than was ever the case before. The skill displayed by the navy in safely and comfortably transporting to Europe and returning to the United States millions of men and enormous quantities of supplies is fully appreciated by their army comrades. We have absolute confidence that the navy end of any combined operations will be fully cared for. And the success of our troops abroad warrants a similar confidence as to the army end, when given time to organize and train. It is the work of the two together in combat operations that needs attention and study.

History furnishes many examples of overseas combined operations involving landings on hostile shores; but modern developments in offensive and defensive armaments make a study of the details on these former operations of little value. Among the few instances in history that may be studied with profit, the Dardanelles expedition is a prominent example. It was in this expedition that much skillful command and staff work was combined with many errors. Even wonderful gallantry was unable to overcome the handicap of these errors. In studying this campaign one is impressed with the fact that no matter how splendid the plans of the supreme commanders, ashore or afloat, may be, unless the details involving team work are carefully worked out and known by the subordinates responsible for their proper execution, failure will result.

The ideal conditions for a landing operation are those wherein the attacking party holds a base relatively near a hostile objective but so located that, with other considerations, the possible front of attack is so extensive as to prevent the defense from being strong enough at all points to prevent the landing.

Whether the base is close or distant, a study of the problem leads to the belief that the possible point of attack or alternative points of attack must be decided upon before the expedition sails, and preparations made accordingly. While many details must always be the same, there are many other details which will vary with the selected point of attack. Where but one point is selected before sailing, the arrangements may be simple. But if there are alternative points of attack the problem of so arranging details as to meet the different situations becomes more complicated. Exact

knowledge will materially assist in selecting a point of attack. Hence it follows that information is, as always, most essential.

A very prominent feature in the study of these expeditions—one which becomes more and more important as the study is pursued—is the absolute necessity for the fullest and frankest understanding and cooperation between the land and sea forces. At one point the interests of one service is predominant, and at another part the interests of the other must prevail. Only a complete mutual appreciation of the powers and limitations, the strategy and tactics, by each service regarding the other, can produce the desired result. No one who is unable to understand that the interests of his own service may at some part of the operations be subordinated to that of the other service should be placed in command. His ignorance, leading to stubborness and false pride, will but insure failure.

A brief conception of the handling of a combined hostile landing operation is as follows:

Since the *raison d'être* of the operation is the successful placing and establishment on a hostile shore of a land force, it would seem that, considering all available information, the initial step in the problem would be a land solution. The army should determine approximately where, when and in what force it is desirable to make a landing. Taking this situation from the army, the navy would solve its part of the problem with a view to meeting the army needs. If the operation is practical from the navy standpoint, well and good. If, however, study shows insurmountable difficulties, they must be pointed out and, by conference, adjusted. It may be necessary for the army to make an entirely new estimate and form an altogether different plan, or it may be that slight changes will enable the navy successfully to carry out its part of the operation. Under any circumstances, these matters must be worked out in conference before the expedition is launched. Mutual and absolute confidence must be expected and extended by each service to the other—all jealousies great or small eliminated.

Having determined the "when, where, and how much" of the forces, the next step is the arranging of the details. This requires closely coordinated staff work and absolute cooperation. The hostile terrain and other conditions will govern the army in determining how best, tactically, from the army viewpoint, the troops should be landed on the beach in order to carry out the advance to form the necessary "beach-head." The knowledge of the tactical require-

ments of the army will be an important factor to the navy in determining what ships shall be used for different units of the army and how these ships shall be loaded. Here the navy will meet the army's wishes to its utmost. When the shipping situation prevents a full compliance with army needs the difficulties will be pointed out and alternative solutions made. The army must then modify its plans accordingly. In addition to the combat personnel and matériel, close attention must be paid to the landing of other supplies, and here again both the army and navy desires and necessities must be met.

Before sailing, every detail as to the actual landing of the troops should be considered. The soldier-man in a boat is helpless and very vulnerable. His only protection while en route from the transport to the beach are cover and speed. Every landing operation presents a different problem so far as the safe landing of troops is concerned. Some of the factors that enter are: The character of the beach, the depth of the water, amount of surf, prevailing winds, direction and force of local currents, amount of fresh water close to landing, character of terrain close to beach, character, location and extent of the actual and passive defenses, distance transports must lie off the selected landing point, etc.

If sufficient reconnaissance has been or can be made of the landing place to warrant a landing under cover of darkness, so much the better. If not, and the landing must be made in daylight, then artificial cover must be attempted. This cover may take one or more of several forms or combinations of forms, depending upon local conditions. With favorable wind, destroyers or small fast "skimmers" may lay a smoke screen. Under other conditions smoke from shells or bombs can be used to blind the land observation points. The ordinary fire from covering ships, aided or unaided by the several kinds of gases, would be used to neutralize hostile fire and interfere with the movements of hostile troops.

It is too much to hope that, except under exceptionally favorable conditions, all the enemy defenses may be smothered all the time. During some part of the time the boats conveying the troops will be subjected to fire. Particularly will enemy machine guns be able to function. It is most desirable that protection for men in boats against machine gun fire be furinshed. This can be done by providing a craft with bullet proof shields. The design of these boats must meet the needs of the troops making the landing and at the

same time overcome the obstacles that present themselves to the navy end. With a base close to the selected landing place, suitable boats may be shipped in parts and then assembled, or they may be built at the base. With the base distant from the landing point the problem of placing suitable landing boats in position for use becomes a serious one. They would have neither the sea-worthiness, radius, nor speed to accompany the fleet under their own power and would probably be incapable of towing. They would have to be carried on ships, either assembled or knocked down and must be so stored on shipboard as to be quickly available when needed. This alone requires careful thought and appears to be mainly a navy problem.

As wire is liable to be found in the waters as far out as, say, a depth of 10 feet, consideration must be given to the design of these boats so as to overcome this kind of obstacle. This may include power to push through the wire, shaping of bow to override it, ramps to drop from bow to enable men to pass over it, and other schemes.

The *Beetle* used by the British at Suvla Bay overcame many of these difficulties. This boat had a speed of 4 or 5 knots under her own power, carried about 500 men, had bullet-proof sides, and a ramp on the bow. But the distance from the British base to Suvla Bay was short. With the base distance and across an ocean the difficulties of placing such a boat in position for use increase enormously.

The question of furnishing, covering and supporting fire during the landing and during the consolidation of the position offers food for thought. Any idea that good troops can be driven out of a position and kept out, and the position captured by gun fire alone, must be abandoned. The "go-get-um" forces are still necessary. It is probable that aircraft will be used by any future landing force. A sufficient number of copies of the best available maps and charts of the vicinity of the landing place must be furnished and these must have a common system of coordinates. The air craft will then be able to assist in the fire control to report to the firing ships the location of favorable targets. As it is well established that hit or miss artillery fire is useless, the method of using the supporting fire of the ships must be carefully planned, probably in about the same way as it is done for land artillery. This would undoubtedly involve the assignment of areas or sectors to certain

ships with the different types of guns having different tasks. In this fire the strength of the navy gun may in itself be a weakness. With the great initial velocity of these guns a very flat trajectory results. This may preclude a barrage close to front line troops and may prevent the searching of reverse slopes where hostile artillery or troops are known or suspected. Overhead machine gun fire from small navy craft, due to the pitch or roll of the firing ship, may be, and probably would be, more dangerous to friends than foe. One way of overcoming this difficulty is by making a careful study of the hostile terrain and so placing firing ships that their long range may enable them to enfilade slopes which are protected from the fire from the front.

Reduced charges in the navy guns may assist somewhat in overcoming the normal flat trajectory. Another solution is found in placing army howitzers on the decks (properly shored up) of ships and using them for needed searching. Even the types and amounts of ammunition that must be carried by the ships must receive careful consideration. Armor piercing shells, while desirable for a naval engagement, would probably not be the most suitable form of projectile for use in covering a landing. The greatest possible amount of proper fragmentation is desirable for a shell exploding on contact with the ground. This would probably not be obtained if the armor piercing shell were used. Smoke shells and different kinds of gas shells, with a knowledge of their tactical use, would also be important. The problem of storing and handling the kinds and amounts of shells that may be necessary in a landing operation will require careful thought.

A system of forward observation for the gun-fire of the ships must be devised. While spotters on firing ships are able accurately to locate splashes with reference to the target in a naval engagement, rear observers experience great difficulty in spotting shots landed in a rolling country. Whether this spotting or front line observation shall be a navy or an army function must be determined, and necessary methods of communicating the information to the guns must be found.

Communication between the forces on shore and on the ships is essential. The best solution for this is for the navy to handle all communication (message sending) between the ships and the beach, while the army takes it up at the beach, and handles all such matters inland. In all this work the point where the army and navy func-

tions seem to begin and end as such—the point of greatest potential friction—is at the beach or shore line. Fundamentally, it must be thoroughly understood that friction *must not* exist, either here or elsewhere. Between properly trained and educated people, each knowing the powers and needs of their own service, and appreciative of the same in the sister service, friction will not exist. People who do not come up to these specifications should not be given an opportunity to interfere with the success of the operation.

The proper solution is for the navy to be in absolute control of the transportation of the troops from the ships to the beach. The soldier-man is merely a passenger. He gets in, sits still and gets out when and as told. The loading, moving, and unloading of the boats are navy functions and all the work of this nature should be under the naval control. The naval representative on the beach is called the beachmaster. This officer controls all naval activities on the beach. He should also establish communication from the beach to the ships, hooking up with the army land communications. While the troops will be under the orders of their own officers on landing and will proceed on their mission as soon as they reach the shore, the army commander should have on the shore a representative to control the newly born service of the rear. This officer of the army might be called the shore commander. He would establish a message center, locate dumps, facilitate the forwarding of supplies and reinforcements, handle stragglers, assist in the evacuation of sick and wounded, form an information bureau, arrange for the building of temporary wharves, secure the necessary labor to unload boats, etc.

The shore commander and beachmaster must work in the closest harmony, and, in addition to great professional skill and energy, must possess unlimited tact. Each will require subordinates, both commissioned and enlisted, and these also must be fully indoctrinated as to the importance of the mission of the force.

It is obvious that it will be necessary to make careful and complete plans as to what will be needed to land and forward troops and supplies, and from the very beginning both the beachmaster and the shore commander should participate in this planning. Schedules must be prepared and the logistics of the boat movements carefully checked up. The amount, character, and location of works on shore, such as temporary wharves, landing stages, protection for men and supplies, etc., must be settled. All who are to be

engaged in this part of the enterprise must be fully informed regarding the details prior to the landing.

In order to avoid confusion on the beach it is necessary that the troops should fully understand what their duties are upon landing. Immediately upon embarking from the boats they should be ready to advance to their designated objective. This would seem obvious were it not stated that at Suvla Bay the orders regarding secrecy were so narrowly interpreted that even after getting into the boats at Imbros many troop officers were uninformed as to what was to be their line of advance or their objective after landing in the dark on the beach. This is, of course, entirely an army function. Previous instruction and drill will be required to secure smoothness in embarking and debarking the troops.

In every operation, military, naval, or civilian, personal acquaintance and conference are valuable assets. To promote this end, the army commander should be on the same ship as the naval commander. Their respective staffs should be in close personal touch, the beachmaster and the shore commander must know each other and even the soldiers and sailors should be in contact with each other. Each seeing the other service at work will appreciate the skill required and will respect and admire the other in a degree corresponding to their knowledge. At certain stages the needs of one service are paramount; at other stages this service must yield; while at other times each must yield and a compromise be arrived at which will best secure the desired ends. The navy loads the ships to meet the army's future needs; the army has no say as to the voyage or handling of the fleet; the navy controls the boats that put the troops ashore in accordance with the army desires; and the navy supports with fire the advance made in accordance with army plans.

The keynotes of an operation in landing on a hostile shore are:

Knowledge of one's own service.

Appreciation of the sister service.

Personal acquaintance and contact in the planning and conduct of the operations.

Absence of service prejudices with resultant complete harmony and cooperation in the team work so necessary for the accomplishment of the mission.

With a full appreciation of these key-notes, and the will to win, success will crown the combined efforts.

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A BIRD'S-EYE VIEW OF ADMIRALTY LAW AND PRACTICE

By LIEUT. COMMANDER W. H. FAUST, U. S. Navy (Ret.)
Lecturer on Admiralty Law at the University of Michigan

Man travelled by water before any other method of transportation was known. The raft and then the dugout probably were the first cargo carriers as well as the first men-o'-war. It has taken thousands of years to advance to the present freighter, passenger liner and super-dreadnought. These marvellous changes in ship construction have not been followed by equally radical changes in the law of the sea, because the basic principles of this law have ever remained the same. These principles began with customs founded on the natural laws of right and justice, and, with the passage of time, were broadened in scope as the horizon of the adventurous sea-faring peoples of the east became extended. Along the shores of the Mediterranean civilization advanced rapidly and the inhabitants of the shores washed by these waters became the foremost commercial people of the earth. It was but natural, therefore, that the first laws of the sea, of which we have any authentic account, should have been codified and administered in that region. These are known as the Rhodian Code, or *Lex Rhodia de jactu*. The Phoenician traders planted colonies along the shores of the Mediterranean; the Carthaginians became their successors, and finally the Romans, copying the methods of warfare and commerce from the Carthaginians, became the rulers of the known world. With this increase in commerce the Rhodian Law was extended of necessity to suit the changing conditions of a growing civilization. We find in the Roman Civil Law many provisions regulating the rights and responsibilities of ships; and from these, the Rhodian Code, and new customs grew the *Consolado del Mare*, a collection of marine laws, of which the author and date are

unknown, but which antedate the fifteenth century. It is supposed to be a compilation of the marine customs of the trading nations of Europe, especially of those bordering on the Mediterranean.

Lying off the western coast of France is a small island, Isle d'Oléron, which was of maritime importance in the middle ages. It is of historical knowledge that Richard I, when returning from the Holy Land, stopped at this island, which then formed part of his domain, and became so impressed with the wise laws relating to the customs of the seas as administered by the courts of the little isle that he compiled them and carried them to England when he returned. These Laws of Oléron and The Black Book of the Admiralty form the basis of the maritime laws of England. Both on land and sea England was ruled by the laws of custom; by the common law on land, and The Black Book and Judgments of Oléron on the sea. That the Laws of Oléron were to be considered as part of the law of England is indignantly denied by Lord Esher, Master of the Rolls, in the great case of "The Gas Float Whitten No. 2" (Law Reports, 1896, P. D., 42). In delivering his opinion the Master of the Rolls says: "It was attempted by one of the counsel for the respondents to say that the Laws of Oléron were to be considered as part of the law of England. To any one who reads some of their strange enactments—as, for instance, in the Laws of Oléron (Art. 23): 'If a pilot through ignorance causes the ship to miscarry, he shall make full satisfaction, or lose his head.' (Art. 24): 'If the master or one of his mariners or any one of the merchants cut off his head, they shall not be bound to answer for it.' (Art. 26): 'If the lord of any place be so barbarous as to maintain (wreckers, etc.), he shall be fastened to a post or stake in the midst of his own mansion-house, which, being fired at the four corners, all shall be burnt together,' etc.—it must be ridiculous to suggest that they are part of the English law. But they contain many valuable principles and statements of marine practice which, together with principles found in the Digest and in the French and other ordinances, were used by the judges of the English court of admiralty when they were moulding and reducing to form the principles and practices of their court." There are some naval officers who, if they happen to read the above observations of Lord Esher, will agree that the Laws of Oléron were founded on right and justice and regret that they are not included in our International Rules of Navigation.

> The judicial power shall extend . . . . to all cases of admiralty and maritime jurisdiction.
>
> The judicial power of the United States shall be vested in one Supreme Court, and in such inferior courts as the Congress may from time to time ordain and establish.

These two clauses in our Constitution comprise the full grant of power necessary to deal out and administer justice in all the intricate ramifications of business incident to navigation and commerce on the high seas and inland waters as carried on by the individuals and corporations within our territorial limits.

"The judicial power shall extend to all cases of admiralty and maritime jurisdiction." Each word here is clear, definite and apparently unambiguous. Still, especially for the first sixty years of our national existence, the meaning of these words, collectively and individually, and the intent of the framers of the Constitution caused endless controversies to be brought before the federal courts for consideration and decision. Even the Supreme Court has vacillated at times and, while it practically never "reverses" itself, it has had to "reconcile" its earlier decisions with later ones in a way that the naval officer would describe as an "about face." The word "admiralty" had to be defined and its derivation determined. We know that it comes from "admiral," but what did "admiral" mean in the language from which it came? Authorities are not agreed on its derivation but all agree that it means to all civilized nations "Lord of the Sea." It might be said that the weight of authority ascribes it to one of the Mediterranean countries. As it has a peculiar interest to the navy, aside from its legal aspect, it might not be an unprofitable disgression from the subject to quote the result of Browne's search for its origin: "Many languages have been searched for the derivation of the celebrated word admiral, or ammiral (as Milton spelled it): Some derive it from the Greek αλμυγος salsus, because his jurisdiction extends over the salt seas. Others from the Saxon *aen mere eal;* that is, over all the seas; and others again, whose opinion Godolphin approves, partly from the Greek, partly from the Arabic; *amir,* or *emir,* in Arabic, signifying *praefectus;* and αλιος in the Greek language, *marinus,* both which amount to admiralius, or rather ammiralius. Certain it is, that in the east, the appellation was also given to terrene princes and commanders: Thus the Sultan, or tyrant of Babylon, frequently mentioned in their transactions, was also and commonly called admiral."

"Maritime" is not considered synonymous with "admiralty." It amplifies and extends the meaning of the latter in order to fulfill the intent of those great and learned men who framed our Constitution to preclude the possibility of giving the phrase a narrow construction.

"The judicial power of the United States shall be vested in one Supreme Court, and in such inferior courts as the Congress may from time to time ordain and establish." Combining these two constitutional grants gives the federal courts exclusive jurisdiction over *all* suits or controversies which are maritime in their nature and occur on public navigable waters. Through its grant of power Congress divided the United States into judicial districts and established in each district a court of original jurisdiction to try suits, including all cases of admiralty, of various characters cognizable by the federal courts. This court is called the district court. Therefore all admiralty suits must be begun in this court.

During our colonial period the vice-admirals of the several colonies were given commissions from the crown, with a jurisdiction far more extended than that enjoyed by the admiralty courts in the mother country, to try all admiralty cases arising within the limits of their territorial boundaries. Admiralty jurisdiction in the mother country was limited to tide waters and the high seas; and for many years after the Revolution the jurisdiction of our own courts was similarly limited. One of the notable cases in the records of the Supreme Court is where this august court, in order to decide whether an admiralty court had jurisdiction or not, found itself gravely considering the question whether the tide ebbed and flowed at New Orleans. As commerce in this country grew, both on the seaboard and the inland waters, this rule of limited jurisdiction to tide waters became embarrassing to the courts. The precedential ice was broken when the Supreme Court decided that the framers of our Constitution did not mean to adopt the English restricted view of this jurisdiction; but it was not until 1851, in the celebrated case of "The Genesee Chief," that the last barriers were swept away and, with Chief Justice Taney delivering the opinion, the Supreme Court decided that conditions in this country were so vastly different from those in England that our courts could not be bound to the "tide water" rule, but that "navigability" should be the test of this jurisdiction. At one leap admiralty jurisdiction was extended to all public navigable waters capable

of carrying commerce. This means the Great Lakes and their connecting waters; the waters of the Mississippi Basin; all canals through which foreign commerce may be carried on. It does not include, however, waters entirely within the limits of a state which are not connected, naturally or artificially, with waters which form avenues for foreign commerce. Foreign commerce in its legal conception means commerce between states as well as with foreign countries. The Albemarle and Chesapeake Canal, the Illinois and Lake Michigan Canal, the Cape Cod Canal are all "public navigable waters," and subject to admiralty jurisdiction.

Besides the many interesting cases that have arisen to determine what are and what are not navigable waters, as large a number has been brought before the courts to determine what craft come under admiralty cognizance. Generally, it may be said, that any movable floating structure capable of being navigated and designed for navigation comes under its jurisdiction. The test here is "designed" for and "capability" of being navigated. It may be said that on the subject of what constitutes a vessel the courts are by no means in accord. A floating dry-dock which had been moored in the same place for more than 20 years was decided as not being intended for navigation and therefore admiralty had no jurisdiction. If it had been designed to be towed to different places in the same harbor it is very probable that the court would have decided otherwise. A floating boat-house permanently attached to a wharf was decided to be a craft designed for and capable of navigation. Lighters of all descriptions, floating elevators used for the storage of grain and designed to be moved from one point to another, dredges, floating movable derricks and pile drivers, floating movable bath-houses, all come under admiralty cognizance. On the other hand a vessel tied to a dock for the winter and used for the storage of grain, or a large gas buoy shaped like a boat, or a dismantled steamer used as a hotel and which met disaster while being towed from one place to another are not such craft as give admiralty jurisdiction. There are many decisions on both sides of the question whether a raft is such a structure as to come under this jurisdiction. The weight of authority and reasoning is in favor of jurisdiction, especially if the facts show that the raft is manned and steered.

The seamen or merchantmen have been considered, from the earliest days of water transportation, to be the wards of the admi-

ralty. Their contracts are closely scrutinized by the courts and if they contain a suspicion of fraud or seem to be unduly harsh the courts will not hesitate to declare them void. Every person, with the exception of apprentices, who is employed or engaged to serve in any capacity on board a vessel is deemed and taken to be a seaman. Congress has incorporated his rights in statutes which now protect him from the "crimp," the boarding-housekeeper and the "bruiser" who thrived by shanghaiing drunken men. His lien for wages ranks at the very top; he is no longer subject to corporal punishment, although he may be put in irons for disobedience; he may not be arrested for desertion and the only punishment that may be inflicted for this crime is total or partial forfeiture of wages and effects; he may demand at least one-half of his wages due in every port so long as this demand does not come oftener than once every five days. The above and many other changes in the old-time status of the sailor have been made by the La Follette Act. The sailor is considered to be of the same nationality as the flag under which he sails, no matter what his real nationality may be. While the seaman has a lien on the ship for his wages the master has not; he must look to the owners for his pay. The English statutes give the master such a lien both for wages and disbursements.

In this country the admiralty courts have jurisdiction over suits brought by, and against, pilots. A pilot is required to exercise ordinary care; that is, the ordinary care of an expert in his profession. He is responsible for his own negligence, and this may not be charged against the pilot association to which he may belong if it happens to be the ordinary association one finds in this country. State statutes regulating pilots are considered constitutional since they come under those subjects upon which Congress may legislate, by virtue of its right to regulate interstate and foreign commerce, but, until it does legislate, these state statutes control.

It is difficult to say just what degree of authority a pilot has when he steps aboard a ship. He takes the place of the master in navigating, gives the orders to the wheel, designates the time, place and method of anchoring, and handles the ship generally. The master's duty is not to interfere with any orders the pilot gives unless he sees the latter is plainly incompetent or reckless. The ship is just as much responsible for the acts of the pilot as for the acts of the master himself; so, if the master interferes with the pilot in handling the vessel he is liable to relieve the latter from all

responsibility for damage done by the ship while supposedly under the pilot's sole charge.

Many state statutes regulate the fees that pilots are permitted to charge; many of them, too, are compulsory in requiring the employment of a pilot. The ship cannot avoid the payment of the pilotage fee where the employment of the pilot is mandatory. In case of evasion or refusal to accept a pilot either the pilot or the association to which he belongs may proceed *in rem* against the ship herself to compel the payment. This right is based on the theory that the maintenance of experts in this line is necessary for the public welfare, and like the city fireman, though it may happen that an individual may never need his services, he must be maintained for a call when required. Another reason is that it minimizes the danger of blocking channels either by running aground or being sunk by a collision.

One of the earliest known subjects of maritime law relates to "general average." All the old codes, including the Rhodian Code, provided that when a ship in distress was compelled to part with some or all of her cargo, her own gear, or even that she herself be run ashore in order to save either cargo or ship, all those interested in the marine adventure, if the subject of their interest was thereby saved, must contribute to the loss sustained by this jettisoning or grounding. Either the goods or gear must be thrown overboard or the ship run ashore *voluntarily* by the master or by his authority, in order to save either lives or property, or the question of general average will not arise. The test is whether the action of the master was voluntary or involuntary. In the former case it would be general average, in the latter, a peril of the sea where the loss must be borne by each owner who suffers from it. An interesting and decisive case happened where the cargo of a ship lying at a wharf caught fire and the port authorities had her towed out in the stream where her hold was flooded with water by a fire tug. The court decided that this was not a case of general average because the loss of the ship, which sank and became a total loss, was not caused by the voluntary act of the master or by his authority, although he was present, but by the municipal authorities to prevent the spreading of the fire. Another interesting case was that of a sailing vessel anchored off Buenos Ayres which broke adrift during a pampero and started up the river. It was inevitable that she would ground somewhere but because the master intentionally stranded her at a

point where the cargo could be saved the owners of the cargo had to contribute to the owners of the ship for her loss.

In fixing the responsibility for damage caused by a tug and her tow the question hinges on whether the tug or the tow was directing operations. The position of the tugman is quite similar in this respect to that of the pilot. The tow is not liable for the tug's negligence where the latter directs the movements of both; and *vice versa,* the tug is not liable for the acts of the master of the tow where the latter is directing the navigation. If the tow is at the end of a line she must take all ordinary means to avoid danger or damage even though she was placed in the position by the negligent acts of the tug. "Ordinary" in this connection means what could reasonably be expected of an expert in navigation and seamanship.

When the tug is towing alongside the tow it is usual in the merchant service for the master of the tug to direct operations from the bridge or forecastle of the tow, and the tug alone would be responsible for any damage caused by the tug or tow assuming that the management of both vessels was solely by the master of the tug. The courts generally hold the relationship existing between the tug and the tow to be the same as that between the hirer and driver of a taxicab. The "fare" merely states his destination. The driver, who is the agent of the owner of the taxi and not the implied agent of the "fare," and his employer become liable for the former's acts. On the other hand if the tow directs the navigation and the tug simply furnishes the motive power, the responsibility, aside from any negligent acts of the tug, would rest solely on the tow.

Salvage, like general average, is of very ancient origin. It has the distinction, moreover, of being purely maritime in its nature as nothing analogous to it is to be found in the civil law. Its justification is based on public policy; its purpose, to stimulate the saving of life and property when in peril of loss, and to encourage others to risk their own lives and property not only from humanitarian instincts but for the reward which follows success. Chief Justice Marshall stated the doctrine of salvage in the following language:

> If the property of an individual on land be exposed to the greatest peril, and be saved by the voluntary exertions of any person whatever, if valuable goods be rescued from a house in flames, at the imminent hazard of life, by the salvor, no remuneration in the shape of salvage is allowed. The act is highly meritorious, and the service is as great as if rendered at sea,

yet the claim for salvage could not perhaps be supported. It is certainly not made. Let precisely the same service, at precisely the same hazard, be rendered at sea, and a very ample reward will be bestowed in the courts of justice.

Salvage is defined "as the reward allowed for a service rendered to *marine property*, at *risk* or in *distress*, by those under no obligation (independent of statute) to render it, which results in benefit to the property if eventually saved."

Each element in this definition must attach to property subject to the salvage award or it will not be permitted by the courts. It must be connected in some way with a vessel, either a life or property; the life or marine property must be in danger of loss, injury or destruction; the service must be rendered by a ship or persons under no obligations to render it; and the service must be successful. The master or crew of a salved vessel are not allowed salvage claims unless the services rendered have been extraordinary and they have exposed themselves to serious injury or loss of life. They are bound to render all reasonable service to preserve the passengers, ship and cargo from loss, and, incidentally, to save their own lives. Because a passenger is supposed to be interested in saving his own life, he must render some extraordinary service to be granted an award of salvage. A passenger on the *Great Eastern* was allowed salvage for rigging up an ingenious device, in the nature of a jury rudder, by which the ship was brought safely to port. On the contrary an English naval officer, who was a passenger on a brig, contributed his assistance when she was in distress, and claimed remuneration for his services. Lord Stowell said: "Where there is a common danger, it is the duty of every one on board the vessel to give all the assistance he can; and more particularly this is the duty of one whose ordinary pursuits enable him to render most effectual service. No case has been cited where such a claim by a passenger has been established, though a passenger is not bound, like a mariner, to remain on board, but may take the first opportunity of escaping from the ship and of saving his own life. I reject the claim." These two cases are on opposite border lines and it is impossible to reconcile them.

A pilot, for any services rendered in the line of his ordinary duties, may not lay claim for salvage. Neither may a tug, under ordinary circumstances, while executing its contract of towage. However, if a tug has not been negligent and, with her tow, is

overtaken by a storm of such violence that extraordinary exertions, involving exposure to injury or loss of the tug, are necessary to bring the tow to safety, she may be awarded additional compensation, beyond the terms of the contract, as a salvage award.

The service itself must be successful either in a complete rescue or in placing the imperiled property in a better position from which it is subsequently rescued. Even if a disabled ship is towed a thousand miles by a salvor and sinks at the harbor entrance, the time, labor and expense incurred are lost irretrievably.

It is a general rule that government employees, while engaged in the performance of their regular duties, may not claim salvage. For whatever assistance they render outside of their regular duties or employment they occupy the same status as any other salvor and may claim the award.

The courts have a wide discretion in awarding salvage. The amount and the method of distribution depend on the facts in each case. The character, skill, danger, labor and expense incurred by the salvors, the value of the property in peril and the value of the property risked by the salvors, the locality of the operations, and the time lost by the salvors—all enter into the court's calculations to determine the percentage of the value of the property saved to be awarded to the salvors. Besides the above reasons most courts are liberal in this bounty from motives of public policy in order that encouragement should be given future salvors to risk both life and property to save those in peril.

In late years, professional salvors have become institutions in all large and busy seaports. The courts encourage them by awarding large bounties when their efforts are successful. Their overhead expenses are extremely heavy, and it is only these large awards that induce them to be ready at a moment's notice to answer a hurried call for assistance. Most of the salvage work they do is by contract and the courts look with favor upon these if the negotiators are on equal terms and the salvor has not taken advantage of the unfavorable position of the endangered vessel, and the contract is not tainted with fraud or misrepresentation.

The amount of the salvage awarded is in the discretion of the judge. He apportions it among all those who participated, directly or indirectly, in rescuing the property. It is customary, however, for the court to award three-fourths of the amount to the owners

of the rescuing vessel and the balance to the master and members of the crew according to their ratings and services.

The word "tort" in legal language means a wrong committed for which the law demands compensation in damages. In admiralty the test of its jurisdiction is the "locality" where the tort was committed. Unless it occurs on navigable waters, either natural or artificial, admiralty has no jurisdiction. Many curious cases have come before the courts in this branch of maritime law, and, while the decisions in many of its phases leave them no longer doubtful, there still remains a border line along which many decisions are wholly irreconcilable. It is now recognized as established law that a ship is not liable, *in rem*, for damage she may cause to any structure attached to the shore, as a pier, a bridge, a warehouse, a floating but stationary dry-dock, or a marine railway. In a leading case a schooner rammed her jib-boom through a grain warehouse, tearing such a hole in the side that quantities of grain ran overboard. In another a ship on fire communicated the fire to buildings on shore whereby the buildings were consumed. In each case the court decided it had no jurisdiction. This means only that the admiralty court had no right under the Constitution to try the cases. The same judge sitting in the same chair could try them in his capacity as district judge hearing civil suits. There are many reasons, which will be stated later, why litigants usually prefer to get their cases before the judge sitting as a court of admiralty than as a common-law court.

If a ship is passing through a draw-bridge and, due to the carelessness or negligence of the bridge-tender, she is injured, the vessel has a right to sue the owners of the bridge before the admiralty court; if a stone is thrown by a person on shore and it injures a person on a ship the wrongdoer may be sued in admiralty. On the other hand if one on a ship throws a stone and injures a person on shore the latter must sue in the common-law courts and not in admiralty. Injuries by a vessel to a bug-light, to a submarine cable, to piles surrounded by navigable water, give a right to damages triable in the admiralty court.

The common law doctrine that contributory negligence bars recovery for personal injuries does not apply in admiralty. The award is very largely in the discretion of the court, and the amount of damages awarded will depend upon the degree of negligence of

the participants in each case, though many courts have given damages to persons who have been even more negligent in causing the loss or damage than the vessels.

Independent of statute there is no right of action in our admiralty courts for injuries resulting in death. In England to-day no such right exists even by statute to proceed *in rem* in admiralty against a vessel for causing death. The "Merchant Marine Act," passed in 1920, confers jurisdiction of such cases upon the admiralty courts and remedies thereby the curiously helpless position of the court to give relief in cases so purely maritime in their character.

Collisions between vessels, due to the negligence of one or both, are torts and give rise to a large proportion of the damage suits that occupy our district courts. For the purpose of avoiding collisions we have four sets of rules in this country: the International Rules which apply to the high seas outside of certain arbitrary limits fixed by the Secretary of the Treasury, the Inland Rules for coast waters and the connecting waters inside these fixed limits, the Rules of the Great Lakes and their Connecting Waters, and the Mississippi Valley Rules. Besides these rules local and port rules are enforced by the courts. They view these rules as so clear and explicit that, except for inevitable accident or inscrutable fault, collisions are considered due to negligence or fault of one or both vessels. Naturally, if one vessel alone is at fault she is responsible for all the resulting damage up to the full value of the negligent vessel. If both vessels are at fault the total damage is equally divided irrespective of the degree of fault of each. Herein lies a curious difference between the admiralty and common-law courts. "The common-law rule says, as each occasioned the accident, neither shall recover at all, and it shall be just like an inevitable accident, the loss shall lie where it falls. Admiralty says, on the contrary, if both contributed to the loss, it shall be brought into hotchpotch, and divided between the two."

Proceedings against a ship in an admiralty court are begun by filing a libel. The ship is then arrested and a representative of the United States marshal is left on board as a keeper or guard. The owner of the ship has no court notification of the arrest except as he may happen to see the copy of the warrant of arrest that the marshal nails to the mast or the door of the captain's cabin, or as it appears in a newspaper. To prevent the delay in loading

and sailing of a vessel under arrest it is usual for the owner to file a bond with the court as surety for the payment of any judgment that may be assessed against the ship. The ship itself is looked upon as an entity capable of making and executing contracts and agreements, committing torts, and satisfying all claims for damages or maritime judgments against her. Proceedings *in rem* bind the whole world; therefore the sale of a ship by an admiralty court purges her of all claims of every nature which are not included in the court decree. A ship in the custody of a state court will not be interfered with by a United States marshal, but the state court has no power to sell the ship and clear her of maritime liens such as the federal court has.

The proceedings in admiralty courts are quite simple, direct and informal. The judge decides questions both of fact and laws. Therefore, trial by jury is unknown; in fact, trial by jury is not permitted except on the Great Lakes, and here only by a curious clause in a statute passed in 1845 and now obsolete. It takes a vast experience in this technical branch of the law for a judge to decide correctly and justly questions of fact as presented by the evidence. It is notorious that a sailor makes a most unreliable witness. His ship or captain is never wrong, therefore the court must be a keen judge of human nature as well as of law in order to decide just how much of real truth is contained in the evidence of the sailor witness. This side of the sailorman's nature is not due to any lack of appreciation of the sanctity of his oath but to his loyalty to his ship. For this reason the courts are lenient as well as skeptical and prefer to draw their inferences from the general evidence and their knowledge of the ways of ships and the character of the men who follow the seas for a livelihood or for adventure.

Lawyers who practice in the admiralty courts are called "proctors." No branch of law is more technical than admiralty. Consequently it is necessary for a proctor in admiralty to be thoroughly familiar with the language of the sea, the customs of the sea, the rules of navigation, the construction and handling of vessels, in short, he must be a real sailorman in order to appear to advantage or on equal terms with his opponents. The judge is not easily deceived and soon sizes up the abilities of the opposing proctors. Possessed of this technical knowledge, and a legal one, the practice before the admiralty court is by no means difficult for the man of

ordinary talents. It is so clean and devoid of chicanery that it has been dubbed the "aristocratic" branch of law. Its very peculiarities, its radical differences from the excessive technicalities of the common law, its methods of procedure and the celerity with which a case is tried and decided, make it the chosen field of litigants even when other courts have concurrent jurisdiction.

MINUTES OF ANNUAL MEETING, 1921

U. S. NAVAL ACADEMY, ANNAPOLIS, MD.,
14 OCTOBER, 1921.

In accordance with Article V, Section I of the Constitution, two weeks' notice having been given, the annual meeting was held in the Board Room of the Officers' Mess.

Commander John Downes, U. S. Navy, Senior Member present, presided.

The minutes of the last meeting were read and approved.

The first and stated business being the election of officers, the following tellers reported the vote, having been appointed by the Vice-President ten days previous—

Commander E. D. Washburn, U. S. Navy.
Commander D. A. Scott, U. S. Navy.
Lieut. Commander J. L. Hall, Jr., U. S. Navy.

The tellers reported the results of the election as follows:

For President

Rear Admiral B. A. Fiske, U. S. N.	1093
Rear Admiral W. H. G. Bullard, U. S. N.	293
Scattered Votes	15

For Vice President

Rear Admiral H. B. Wilson, U. S. N.	1299
Scattered Votes	30

For Secretary and Treasurer

Commander F. M. Robinson, U. S. N.	1057
Lieut. Commander R. A. Hall, U. S. N.	291
Scattered Votes	11

For Board of Control

Captain John Halligan, U. S. N.	941
Commander J. O. Richardson, U. S. N.	884
Brigadier General Richards, U. S. M. C.	819
Captain T. L. Johnson, U. S. N.	803
Captain J. A. Furer (C. C.), U. S. N.	761
Commander John Downes, U. S. N.	711
Captain T. R. Kurtz, U. S. N.	502
Commander W. R. Van Auken, U. S. N.	442
Commander H. D. Cooke, U. S. N.	401
Commander J. O. Fisher, U. S. N.	396
Lieut. Commander S. E. Holliday, U. S. N.	369
Commander W. W. Smythe, U. S. N.	341
Commander I. C. Kidd, U. S. N.	314
Commander Abram Claude, U. S. N.	229
Commander John S. Barleon, U. S. N.	201
Scattered Votes	37

The following officers were then declared elected:

President

Rear Admiral B. A. Fiske, U. S. Navy.

Vice President

Rear Admiral Henry B. Wilson, U. S. Navy.

Secretary and Treasurer

Commander F. M. Robinson, U. S. Navy.

Board of Control

Brigadier General George Richards, U. S. M. C.
Captain John Halligan, Jr., U. S. Navy.
Captain T. R. Kurtz, U. S. Navy.
Captain J. A. Furer (C. C.), U. S. Navy.
Commander John Downes, U. S. Navy.
Commander J. O. Richardson, U. S. Navy.

The Secretary and Treasurer presented his annual report as follows:

1. The cost of print paper, printing, binding, etc., has decreased approximately 15% in the past year, so that the printing cost of the PROCEEDINGS is approximately thirty-five cents a copy, leaving a printing loss of about ten cents a copy per issue. This loss added to the uncollected due and overhead expense gives a monthly loss of approximately $1000 per month.

2. The sales of the Book Department have fallen off considerably during the last year, and the net decrease in surplus in that time amounts to about $3000. This amount includes the depreciation in market value of bonds on 31 December 1920, as well as more than $3300 of dues charged off as uncollectable.

3. The membership shows an increase of 215 over our last meeting. The present membership is as follows:

Honorary	3
Life	140
Associate	530
Regular	4814
Total	5487

Of these the PROCEEDINGS of about 400, as against 1500 last year, are held up owing to the fact that they are more than two years in arrears in dues.

4. The changes in membership during the year were as follows:

Resignations—		
Regular	251	
Associate	12	
		263
Deaths—		
Regular	19	
Associate	6	
Life	7	
		32
Dropped		
Regular	629	
Associate	0	
		629
Total Loss in Membership		924
New members		1139
Net gain in Membership		215

5. The following Institute Publications have been revised during the year:

Practical Manual of the Compass,
Marine and Naval Boilers,
Steam Turbines,
Mechanical Processes,
Manual International Law.

6. The following books and pamphlets have been published:
   How to Preserve Your Boiler, by Captain E. P. Jessop, U. S. N.
   Composition for Naval Officers, by Professor C. S. Alden and Professor W. O. Stevens.
   Seaman's Hand Book, by Lt. Comdr. R. Wainwright, U. S. N., and Commander M. F. Draemel, U. S. N.
   Storage Battery Manual, by Lieut. Comdr. L. C. Dunn, U. S. N.
   War on the Sea, by Captain Darrieus, French Navy, and Commander Rene Daveluy, French Navy.
   General Index, Prepared by James M. Saunders.
7. The following books are in press or are under revision:
   Airplanes, Airships, and Aircraft Engines, by Lieut. Albert Tucker (C. C.), U. S. N.,
   Reciprocating Engines,
   Athletic Requirements,
   Muir's Navigation,
   French Reader,
   Electrician's Text Book.
8. A revision of the following is contemplated:
   Naval Construction,
   Radio Telegraphy and Telephony,
   Seamanship Department Notes.

The report of the Secretary and Treasurer was adopted.

There being no further business the meeting adjourned at 8.15 p. m.

F. M. ROBINSON,
Commander, U. S. Navy,
Secretary and Treasurer.

U. S. NAVAL INSTITUTE

SECRETARY'S NOTES

Membership

Life, regular and associate, 5514. New members, 32. Resignations, 5.

Practically the whole service receives the benefit of the PROCEEDINGS yet many officers, who read it monthly, are not members and therefore contribute nothing to the support of the Institute. Members are requested to urge non-members to join. Publication costs are now so high that the Institute is carrying a loss. The cost, per member, however, decreases with an increase in membership.

Dues

The annual dues ($3.00) for the year 1921 are now payable.

Regular and associate members of the U. S. Naval Institute are subjected to the payment of the annual dues until the date of the receipt of their resignation.

Discussions

Discussion of articles published in the PROCEEDINGS is cordially invited. Discussions accepted for publication are paid at one-half the rate for original articles, or about $2.25 a page.

Address of Members

To insure the delivery of the PROCEEDINGS and other communications from the U. S. Naval Institute, it is essential that members and subscribers notify the Secretary and Treasurer of every change of address, without delay.

Book Department

The Institute Book Department will supply any obtainable book, of any kind, at retail price, postage prepaid. The trouble saved the purchaser through having one source of supply for all books, should be considered. The cost will not be greater and sometimes less than when obtained from dealers.

The Boat Book, 1920, and The Landing Force and Small Arms Instructions, 1920, are now ready for issue. The price of the former is $.50 and the latter $1.00 per copy.

Index to Proceedings

The attention of readers of the PROCEEDINGS is invited to the classified analytical index for numbers 101 to 200 inclusive, which is noticed under "Publications." This is a most complete index, which has been prepared at considerable expense in order to make readily available the information contained in both the articles and the notes of these issues. Only a limited number of copies are being printed. Price, bound in cloth, $2.35; bound in paper, $1.85.

Articles

The Institute desires articles of interest to all branches of the service, including the Reserve Force. Attention is invited to the fact that the submission of articles is not limited to members, and that authors receive due compensation for articles accepted for publication.

All articles and discussions submitted by persons belonging to the navy for publication in the PROCEEDINGS must be in duplicate, one copy being signed by the author, which will be submitted to the Navy Department when the original is published, as required by General Order No. 46, of May 20, 1921.

Reprints of Articles

The attention of authors of articles is called to the fact that the cost to them of reprints other than the usual number furnished, can be greatly reduced if the reprints are struck off while the article is in press. They are requested to notify the Secretary and Treasurer of the number of reprints desired when the article is submitted. Twenty copies of reprints are furnished authors free of charge.

Illustrations Authors of articles submitted are urged to furnish with their manuscript any illustrations they may have in their possession for such articles. The Institute will gladly co-operate in obtaining such illustrations as may be suggested by authors.

Original photographs of objects and events which may be of interest to our readers are also desired, and members who have opportunities to obtain such photographs are requested to secure them for the Institute.

Notice Whole Nos. 6, 7, 10, 13, 14, 15, 17, 144, 146, 147, 173, 215 and 217 of the PROCEEDINGS are exhausted; there are so many calls for single copies of these numbers that the Institute offers to pay for copies thereof returned in good condition at the rate of 75 cents per copy.

ANNAPOLIS, MD., December, 1921.

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PROFESSIONAL NOTES

PREPARED BY

LIEUT. COMMANDER R. A. HALL, U. S. Navy

GENERAL ARRANGEMENT

VESSELS BUILDING. NAVAL POLICY. MATÉRIEL. PERSONNEL. MERCHANT MARINE. — France ..... 1941; Germany ..... 1948; Great Britain ..... 1951; Japan ..... 1959; United States 1961

AERONAUTICS 1972

ENGINEERING 1977

NAVIGATION AND RADIO 1981

ORDNANCE 1982

MISCELLANEOUS 1983

CURRENT NAVAL AND PROFESSIONAL PAPERS 1984

FRANCE

FRENCH NAVAL NOTES.—The French Navy, that could be said to be slumbering under the Leygues and Landry administrations, has this year resumed active life; the battle fleet has been restored to a war footing and has done much navigating and gun practice, whilst the concentration in Britanny ports of the ships of the *Voltaire* and *Hugo* classes and of numerous torpedo craft, supported by growing aerial and submarine flotillas, has caused France to become anew a potential factor in northern waters. On the other hand, there have been concluded at Lorient and at Toulon ballistic and aerial experiments of the highest value, and under the talented Chief Constructor Doyère the Section Technique has perfected the plans of the *croiseurs rapides* shortly to be laid down. All this does not prevent Minister Guist'hau from being hotly criticized for the delay in the execution of the cruiser programme as well as for the projected reduction in the navy estimates, and impatience is being manifested in Parliamentary quarters at the "naval stagnation."

There is a sign of the times in the election (valueless and illegal) as councillor by Charonne of the ex-mechanician Marty, the chief "hero" of the Black Sea rebellion. Marty, it is worth remembering, only found one supporter in the whole crew of a destroyer, and that individual was not a "marin," but an anarchistic workman serving as engine-room hand. The Charonne election points to the spread of Bolshevism in French industrial centres, as the consequence of liberal Boche subsidies, and it is an additional warning as to the vital importance of recruiting seamen on safe and rational lines; that is to say, among the seafaring classes, or at least among young men having the maritime vocation and electing to make their life's career on the stormy element. This obligation is rendered all the greater by the fact that as a rule French naval recruits commence their apprenticeship at fleet work when over 20 years of age. A counter-patriotic propaganda to oppose Bolshevist efforts is also required.

The recent sale of the 6500-ton *Gardecôtes Amiral Tréhouart*, that acted during the war as Toulon port guardship and was the most perfect representative of the *Jemmapes-Bouvines* class (1893-95), did not pass unnoticed in naval circles, as it is felt coastal ships have not said their last word in warfare, especially since Great Britain, the supreme naval power, had to have recourse to them under the test of the real thing. The designing of coastal armourclads is one of the most difficult tasks confronting naval constructors, for the reason that small *garde-côtes* are intended to fight against the most powerful battleships, and that no end of contradictory elements of strength have to be piled up within displacements too limited to contain them all. No wonder the ideal coast defence ship has yet to be found. In the *Amiral Tréhouart* class Gallic *ingénieurs* endeavored to correct the weak points which sea experience had revealed in the tough but low-freeboard, topheavy, and unseaworthy 7000-ton *Requins* (1885), and they brought into existence *petits cuirassés d'escadre* possessing nominally all the attributes of battleships, viz., good freeboard and habitability, 12-inch guns in closed turrets, and a complete 13-inch belt, together with a speed of nearly 17 knots, which was equal to that of the *Royal Sovereigns* of Sir William White. Splendid units on paper, those *cuirassés économiques* turned out to have their qualities too meagrely measured to be able to derive any practical advantage from them; they were mediocre—insufficient in every respect—and admirals who included them in their squadrons reported very unfavorably upon them. They were very little used either in peace or in war, and, all points considered, they have every right to be counted in the list of the few constructional blunders made by the Rue Royale Admiralty. And yet the small battleships now being constructed by minor navies, and notably by Holland and Sweden, represent, despite the advance made in speed, a similar mistake in conception.

The truth is that in small displacements, from 6000 to 10,000 tons, the best way to attain all-round mediocrity is to heap unreservedly qualities upon qualities, as French constructors are only too prone to do, instead of aiming at excellence in one or two respects, as the English have done with the *Marshal Soults* or *Terrors*, that combine striking power and good anti-torpedo defence, to the detriment of speed and armored protection, also, like the old low-freeboard monitors of America that, by sacrificing nautical qualities, habitability, and speed, were made powerful hitters in fair weather and practically invulnerable to gunfire. In the *gardecôtes* line success resides in specialization and, above all, in the sacrifice of speed as recommended by the late Augustin Normand, the very French constructor who in his time placed France foremost in the production of speed. There is a chance that France, in default of too costly mastodon battleships, may try and utilize her recent ballistic discoveries in small semi-submersible and practically invulnerable all-armoured monitors mounting 450 mm. guns and capable in narrow seas of operating by means of both gun and torpedo against the heaviest battleships now projected. Whilst many experts see in *garde-côtes* an obsolete type of warship debarred of all practical value by the growing range of super-cannon batteries and of coastal aerial flotillas, others pin their faith in the virtue of seagoing instruments *de combat*, and their fertile imagination already pictures a revival of French sea power through the swarming along the coasts of our Republic of funnelless, tortoise-shaped monitors that will be (if built) a modern edition of the remarkable *Taureau* class of 1865 (2700 tons, 12 knots, single-fixed tower surmounted with heavy gun with all-round fire, armour carapace over the whole length and sides). The *Taureau* was designed at a time when Paris naval architects enjoyed pre-eminence, and there is much in the idea that could be modernized in these days of internal motors and submarines.

The aviation problem is, like all navigation problems, a question primarily of recruiting and training. The frequency of aviation mishaps, the terrific speed *avions de chasse* are attaining (over 300 kilometres per hour in last

week Etampes races), and especially the many difficulties that are peculiar to naval aviation, are reminders that without the right sort of personnel superior flying matériel represents no increment of lighting strength for navies. Now, it is no secret that French naval aviation, despite its wonderful strides on paper, has to contend with a growing shortage of trained pilots and mechanicians—a weak point the naval authorities have at heart to remedy, especially since the official report on the *Prinz Eugen* experiments has removed all doubt as to the vulnerability of the best armoured battleships to aerial bombardment. Up to the present young officers and seamen have not been over-anxious to join the aerial wing, not because of the dangers attaching to the aviation sport, but on account of the little esteem in which aviators are held in high quarters and of their consequent diminished chances so far as distinctions and promotions are concerned. Ministers of marine and admirals have at all times around them such a tremendous amount of merit to reward among their numerous staff officers and the friends of their staff officers that they cannot possibly think of those adventurous young men who, forgetful of their own interests, are flying somewhere out of the reach of flagships or of the *Rue Royale bureaux*. And yet the very sources of efficiency are endangered in a naval service when desert and reward are kept too long apart, when those in authority fail to understand that their primary duty is to stimulate and encourage true merits. Above all, no display ought to pass unnoticed of that bold initiative, of that manly courting of risks that are the distinguishing mark and honour of the naval profession. If these principles were applied in what regards the aeronautical branch of the service, if it were made a set rule for young officers to practice flying before being appointed to superior rank, there might be a chance of the "Aviation Francaise" asserting its predominance, but up to the present the chief incentives given to aerial progress have been of a verbal or literary order. A change, however, is to be made, and the flying *élite* is to receive more adequate recognition of its valour and fighting worth.—*Naval and Military Record*, 12 October, 1921.

FROM THE FRENCH POINT OF VIEW.—The attention of the French—and it may safely be added of the world—naval and political students is being centered on present Irish developments; and, no wonder, when are remembered the eventful history of Erin, her peculiar geographical situation, and the vast changes scientific progress is making in the conditions of maritime warfare, and especially in the offensive and defensive possibilities of advantageously-situated strategic centers. Now this description eminently fits the Irish Isle, that is spread on the western flank of England across her route of greater expansion, directly overlooking, so to speak, the outlets of those splendid maritime centers of activity and true arteries of English commercial life, the Severn, the Mersey, and the Clyde, besides being within commanding range of the northern round Scotland routes and of the channel highway. Indeed, considering the mechanism of the economical life of England and the fact that centuries of persevering toil have made her both supreme on the water and totally dependent on the stormy element for her very existence, Ireland may well be proclaimed to be, potentially, the most important strategic factor in the world, and it is not too much to say that a novel era will open in naval politics if seeds of anarchy can be permitted to fully germinate and bring forth their natural fruits, which are nominal independence and civil strife in Ireland.

Of course, it is very true that traditional hostility on the part of Ireland did not prevent England attaining her objects in past wars, and the question is whether the conditions of the naval game have changed so much as to enable Erin indirectly to do to-morrow what she could not achieve yesterday. This is a subject French students view with equanimity, for the two-fold reason that the least sentimental among them do not dream of a Franco-British war, and that France has no need of Ireland to be within striking range of England's shores and vulnerable centers (the

counter advantage being shared by England). But an independent Irish republic would provide an invaluable base of offensive operations for certain powers, with revolutionizing results so far as European strategy is concerned.

If nothing came out of the French 1689 and 1796 expeditions in Ireland this is due to the fact that these operations, besides being mismanaged, especially the second, had limited and purely military objects in view, viz., to drive the English from Erin's soil. Even if Chateaurenault and Hoche, after overcoming the tremendous difficulties that confronted them at sea and when landing, had completely succeeded in their daring attempts they would not yet have been in a position to utilize to advantage the fighting resources of Ireland, which was then in a chaotic state.

Totally different would be the prospects of an enemy of England assured of the co-operation of an independent and organized Irish Isle, surrounded with an inviolable and easily-watched and defended belt of territorial waters. To isolate Ireland, submarine and aerial developments no longer permit; to blockade it might prove ruinous, and yet it would have to be done to secure the freedom of the seas for English trade. Aviation is, as everybody knows, an essentially amphibious weapon, army avions being at all times available for coast defence or even for work over narrow seas, and a few modifications having proved sufficient to transform Army Spads and Nieuports into excellent navy scouts. Thus efficiency in military aviation means also, for any nation, efficiency in oversea fighting, at least within a certain limit. This is a good thing for the French Fleet when are considered the disappointing slowness of naval aviation progress and the frequent accidents for which any exercise or even a squall (a Latham 3-motor machine just capsized and totally lost in Cherbourg roadstead) is the pretext. The source of all the mischief, we are told, is to be found in the stubborn opposition of influential admirals of the retrograde school who have learned nothing by the war and, "in petto," do their utmost to discourage the development of the aerial branch, which they consider to be a danger for the existence of the old navy. Ministers Leygues and Landry at times waxed eloquent over the future of aviation, and Minister Guist'hau, though he has said less, managed to do more in practice. Unfortunately, with the ridiculous and disastrous ministerial instability which is the rule in our republic, "*les Ministres s'en vont, mais les amiraux restent.*" Not only do ministers change too often but also their chiefs of General Staff. We have had three of the latter within the last three years, viz., Ronarch, Salaun, and Grasset, whereas the Conseil Superieur comprises admirals who have never left the Admiralty since 1916 or 1917, all distinguished gentlemen who combine the merit of seniority with the right sort of "piston." Their influence on the naval policy, nominally modest, is in reality predominating for the reason that they are assured of the morrow. With these bureaucrats lies the responsibility for the present condition of the aerial branch. There is little hope for the future, at least so long as an "*amiral-inspecteur de l'aeronautique*"—he, too, assured of the morrow—does not sit in the "*Permanente Section du Conseil Superieur.*" Admiral Daveluy, who is not only the French Mahan, but also a practical aviator, could fill that job excellently, but then he is on the retired list, and "*le réglement*, sacred regulations, forbid his parading anew on the active scene even if the vital interests of his country should require. English broad-mindedness and the practice of hunting for the right man anywhere that he might be found, in disregard of set rules, are shocking to the tradition of the French *fonctionnaire* world.

Happily, matters stand in a different light in the army, which counted 7300 avions in 1918 and, out of 18,000 pilots (1914-18), lost no less than 4500 killed or grievously wounded. What aviation has done and what it is susceptible of doing to-morrow, everybody realizes, scores of flying generals being ever at work to remind the rising generation of the truth of

Foch's saying that he who rules the air will also rule on land. Of course, the notorious shortcomings of the French system of government (four Air Secretaries of State since 1918) and divergencies of views in high quarters, together with financial difficulties, have brought about a tremendous waste of aerial assets: aerial "cemeteries" are studded all over the land and the fine phalanx of "aces" has been dispersed to the wind. Such a spectacle of aerial ruin no other Allied country can offer.

Yet it would be a great mistake to look upon France as being reduced to aerial powerlessness. The creation two years since of a permanent *"Inspecteur Général d'Aeronatique"* in Marshal Fayolle has maintained fighting efficiency, assured steady progress in recruiting and training, as well as in machine designing, as was shown by the aerial maneuvers over Metz, where no fewer than *220 avions de bombardement et de chasse*, mostly coming from Strasbourg, Neustadt, and Thionville, were gathered at a few hours' notice, and gave an impressive display of offensive and defensive tactics, which not the least accident or mishap came to mar. The Marshal-Inspector, who surveyed the operations both from the air and from land, remarked that this masterful demonstration of war readiness only gave an incomplete idea of the capabilities of the four regiments of the division *aérienne de l'Est* that could muster over 500 fighting units for war or for a prearranged theme of exercises. Moreover, this is only a small part of the whole French aerial force that is kept mobilized solely with a view to enforcing the execution of the clauses of the Versailles Treaty and in the interest of all the Allies.

The *Record* has called attention to the sad case of Lieut. Destremaux, of the 600-ton gunboat *Zelée*, who was severely reprimanded by Minister Augagneur for choosing to sink his boat in Papeete Harbour (Tahiti) instead of boldly going out and having a trial of strength on the high sea with the two 11,000-ton *Gneisenau* and *Scharnhorst*, and who subsequently died of grief at this undeserved treatment. Admiral Bienaimé is now urging that justice be publicly rendered to the memory of that gallant officer, who, he shows, did the right thing under difficult circumstances, and frustrated von Spee's designs by landing his guns and setting on fire the coal depôt the Boches had come to seize.—*Naval and Military Record*, 28 September, 1921.

POST-WAR BATTLE PRACTICE.—For the first time since 1914 the Western Mediterranean was echoing last week the reports of big French naval guns engaged in normal battle practice. Hardly had the energetic Commander-in-Chief Salaün regained Toulon than he put again to sea with his few battleships—to the intense disgust of the traders of that *port militaire*—and for the thoroughly military purpose of carrying out his preliminary programme of *"écoles à feu"* that had been arranged on totally new lines with a view to applying war data and meeting the changed—and ever-changing—conditions of the naval war game, which means a departure from the former conventional training practice.

That conventional training does not pay is one of the far-reaching lessons of the Great War, and, as a matter of fact, of all wars. All armies and navies have sinned in that way, for the reason that conservatism is a natural and comfortable attitude of the human mind, and that it is more easy to keep on beholding and copying the past than to consent to the never-ending effort necessary to try and unravel the knotty and ever-growing mass of the fighting problems of the unknown future. Previous to the war, for instance, the great bulk of French naval men were humble followers of Mahan, professed contempt for the *"hérétique et anarch'ste"* Amiral Aube, and had their eyes and admiration centered on Suffren and Nelson, whilst army officers spent their time worshipping in words and in deeds the great Napoleon, being never happier than when permitted to reproduce in mimic *"petite guerre"* incidents of Napoleonic battles. They

were thus napping and stationary, whilst the times kept moving on. The awakening was terrible, and all military critics agree in deploring pre-war training blunders. General Fonville ascribes the fearful losses of the French infantry in 1914 to the habitual and stubborn practice of errors in pre-war "*grandes manœuvers*" and to systematic disregard of the effects of new weapons; and General Serrigny (Souschéf d'Etat-Major General), in his conferences and literary publications, can hardly find enough sarcasm for those blind and unimaginative leaders who are so fond of seeking a guiding inspiration in the contests of the distant past instead of devoting their full attention and brain power to the study of present data and possibilities. Similarly, Admiral Daveluy, who in 1902 (Le Combat Naval) held a 3000 mètres range to be exaggerated ("*si ce n'était la torpille, la distance du combat devrait être à portée de pistolet, comme au temps de Suffren et de Nelson*"), was shown his error by the Jutland Battle, and expressed later his patriotic satisfaction that events spared the "insufficiently-trained French gunners" the necessity to have to fight at long range as British tars had to do.

And yet gunnery training in the French fleet before the war was of no mean order. In 1914, it will be remembered, the English First Lord, Mr. Winston Churchill, expressed surprise and admiration at the performances of the *canonniers* of Admiralissimo de Lapeyrère, in whose company he had witnessed an "*école à feu*," by the squadron of 18,000-ton *Dantons;* and older *cuirassés* like the *Justice* (Captain Schwérer) scored over 60 per cent hits 8500 mètres, the firing ships being all through the test kept moving on a zig-zag at a rate of 12 to 14 knots. It was even claimed then that battle practice was more exacting in the French fleet than in any other, and that French naval guns were the only ones to be habitually fired at full charge in time of peace, a privilege that was the twofold reward of perfect gun design and of perfect gun-powder (this did not prevent cases of gun-bursting in the war, *mais les exceptions confirment la règle*). Admirals Dartige du Fournet and Guépratte, who saw actual fighting in the Dardanelles and in Syria, had not enough praise for their gunners.

At the same time French gunnery had a tendency to routine work. It was earnestly preparing, with English methods and firing appliances, to fight exclusively in fair weather at moderate range and speed, in good 19th century style. With a tricky, go-ahead, matter-of-fact enemy like the Boches, who by tradition had the real thing in view, Admiralissimo de Lapeyrère might not, perhaps, have fared so well as had been expected.

Admiral Salaün is no longer considering battle practice as a mere sport for naval men, but as a means of all-round improvement in the fighting power of the fleet; and to that end *ingénieurs d'artillerie navale* and distinguished representatives of the Board of Construction have been invited to witness the comprehensive phases of the *écoles à feu* that obviously interest just as much those who make the guns as those who handle them. In this way, no end of time and *paperasserie* will be saved; there will be no more need of academic reports to be duly signed, counter-signed, stamped and sealed, read and discussed in committees, approved and confirmed before finally joining "*la montagne d'inutiles paperasses*" which is one of the glories of Rue Royale. From this direct co-operation, under realistic conditions, of the best naval and engineering brains in the service, steady progress may be expected, as gun designing is not a purely theoretical affair, as costly experience demonstrated. Scientific discoveries, however attractive, need to be confirmed and matured by realistic tests; and there can be no better source of inspiration for *ingénieurs* than the illusion of the real thing afforded by mimic action at sea; no field more suited for the fruitful exercise of imagination—and the use of imagination in warfare is revealing itself as being of capital importance.

By this interesting development of firing tests at sea, which will in time also be witnessed by experts of the aeronautical and chemical branches,

Admiralissimo Salaün is showing his appreciation of the military value of the factor time—the main factor of success, as remarked by the great Nelson. Range and speed are two aspects of the factor time; and to keep on progressing is not sufficient. What tells is to progress at a faster rate than all likely opponents, which means a task of immense magnitude, saddling the high command with unprecedented responsibilities. Commanders-in-chief must not be satisfied with attending to the immediate needs of the present; they must live in advance the war of to-morrow in the light of scientific progress that is never at a standstill, and remember the wonderful rate at which inventions came to birth all through the war under the pressure of events. So swift and deadly are the effects of new destructive inventions and so wide is their radius of action, that, next time, there will be no recuperation possible and victory will go to the side having acquired a decided lead in the scientific field. (The frightful consequences of the explosion of "agricultural" gases at Oppau are a proof that the revengeful Boches are already making their profit of those new principles of war.)

To surprise the enemy by new tactics and new weapons to which he can oppose no ready and adequate answer has always been a safe and economical means of securing victory. The Germans had a few surprises in store from which they derived temporary benefits, viz., special shells, smoke clouds, super-cannon, and asphyxiating gases. The English started the tanks. But as noted by General Serrigny, all these "surprises" were tried too soon and on too small a scale to produce decisive effects. The lesson has been learnt; next time will be a game of surprises; and in the field of gunnery, surprise (that is, relative superiority) might be effected by superior accuracy or range and by superior shell efficiency, realizing the ideal of true cannoniers, viz., to hit first and with crushing effects. The French work in the gunnery branch is carried on on progressive lines by the *Toulon Division de Cannonage* (in the *Courbet, Patrie, Pothnau*) and *Ecole de Télémetrie*, and on shore by the *Gâvres* permanent commission of experiments, as well as by the Paris, Ruelle, and Bourges laboratories, without mentioning the increasing contribution of Creusot and other gun-making firms to artillery researches. But it is, of course, at sea, by practice in all weathers of aerial fire control, that reliable accuracy at extreme range can be attained. The French fleet, just like its rival, is practicing the policy of the "*coup heureux*," or lucky shot, formerly so derived, and at the same time sparing no effort to make that "*coup heureux*" a deadly one for the enemy. The important fact is that the chemical science, since applied wholesale to the art of destruction, is adding wonderfully to the power of single shells, which is no longer limited to the same extent as before by caliber and weight, as the Lorient experiments have shown.—*Naval and Military Record*, 5 October, 1921.

PORT EQUIPMENTS.—The economical situation in France generally is not favourable to industrial enterprise of any kind, but the various Chambers of Commerce are fully aware that the countries which prepare for the recovery, when it comes, will reap the greatest benefit, and, aided by the government, a good deal of work is being carried out at the ports for dealing with a much larger volume of traffic than is possible at present. After obtaining her share of the ships surrended by Germany, as well as the large tonnage conceded by Great Britain, France became the third maritime power, and, in view of the programme of colonial development, it has been found necessary to provide the means of utilising this merchant fleet, which will, moreover, extend its operations to South America, and more especially to the extreme east. Considerable harbour extensions are now in progress at Havre, Marseilles and elsewhere, and at all the ports a large amount of elevating and other machinery is being laid down. During the past week the Minister of Public Works paid an official visit to Bordeaux to inspect the installations that have been put down recently, notably the grain elevators and cold storage plants and machinery for rapidly unloading colliers.

Except for Calais, Dunkirk and Havre, where much was done to increase the harbor facilities during the British occupation, nearly all the ports were until recently lacking in the necessary material, and even at Havre the considerably increased tonnage imported at a time when fuel and commodities had to be purchased abroad obliged the local Chambers of Commerce to prepare a vast scheme of extension which is now being put in hand. The work cannot progress very rapidly on account of the shortness of funds, but much is already being done, and there is no doubt that in time the home merchant fleet will be in a position to deal with the bulk of the foreign and colonial trade.—*The Engineer*, 7 October, 1921.

VOLUME OF FRANCE'S FOREIGN TRADE.—For the first seven months of this year the weight of the goods imported into and exported from France amounted to 26,741,488 tons as compared with 34,193,171 tons in the corresponding period of last year. Imports this year were only two-thirds of the 1920 total, while exports were one-third greater.—*The Nautical Gazette*, 18 October, 1921.

GERMANY

THE EX-GERMAN FLEET.—The book which Admiral von Reuter, the Commander of the German fleet which was sunk at Scapa Flow on June 21, 1919, has just published at Leipzig, is one of self-glorification rather than self-justification. He endeavours to convince his readers that he is proud to have acted as a Prussian officer in accordance with the Prussian tradition, but the boast sounds rather hollow. At this safe distance of time from the event, he assumes the whole responsibility for the scuttling, says he had no specific instructions or guidance from the German Admiralty, and shows what a brave deed it was, in sheltered waters, with land near at hand, no one to stop it, and means of rescue plentiful, to open the sea cocks and let his ships founder. It is the same sort of smoke-screen as that laid by Admiral Scheer two years ago when he declared that he rejoiced over the scuttling, which he considered as not only heroic but as one which had vindicated the honour (save the mark) of the German Navy! Were it not that the subject is now so very stale, one might be tempted to discuss again the curious turns which Prussian mentality takes at times.

Apart from this aspect, von Reuter's book, as a footnote to history, has some interesting points. He was beset by many obstacles during his period at Scapa Flow, as much from within as from without. Revolutionary extremists were powerful in his fleet, the officers were practically helpless, and the Admiral was afraid lest disorder might give the British authorities occasion for taking possession. For this reason he declined the British offer to place sentries on board to keep order. On his visits of inspection to his ships in the Flow he was obliged to use a British boat, having discovered that among the crew of his own pinnace were agitators who took this opportunity of spreading disaffection among the vessels' crews. What a commentary is this, however, on the state of the German Navy at the time! By the side of it, von Reuter's solemn deliberations as to his conduct appear almost ludicrous. It mattered so little what he did, seeing that the power of his fleet was destroyed by the indiscipline and discontent of his own men. His words show what the Ex-Kaiser meant when he said to Admiral Scheer on Nov. 9, 1918, "I have no longer a navy." On one occasion von Reuter found the extremists in the *Friedrich der Grosse* so out of hand that all he could do was to ask the British to ship them back to Germany. Two months after he records another mutiny, attributed "to the long strain of internment," and 4000 more men were sent back. Even the order for scuttling was in danger of miscarrying owing to the men getting wind of it, until a fresh order was drafted in a manner so as to appeal to the temper of the crews.

It must be left to the future historian to determine the exact degree of Admiral von Reuter's responsibility for the sinking. While it suits him to shoulder it in full, it is only fair to point out that the British Admiralty salved from his flagship the *Emden* two years ago a letter from Admiral von Trotha, Chief of the German Admiralty, dated six weeks before the scuttling, in which there was a passage which von Reuter evidently interpreted as most other people have done, as a clear hint that the ships must not be allowed to pass into the hands of the Allies. The Supreme Council, moreover, decided that the responsibility for the sabotage fell on the German Government and not on individual German officers, so that von Reuter escaped punishment, and additional ships were surrendered in consideration of those lost. Naturally, von Reuter does not explain that, in the long run, it made no difference to us whether the ships were sunk in Scapa Flow or saved to be used as targets, like the *Ostfriesland* in America and the *Thuringen* in France. No ex-German battleships or battle-cruisers were wanted, or are being preserved, by the Allies. But nothing can remove the added stain of dishonour from the escutcheon of the German fleet caused by the sinking.—*The Army and Navy Gazette*, 8 October, 1921.

HELIGOLAND.—The demolition of the fortifications of Heligoland are now said to have been satisfactorily carried out, and the special commission which has been watching the progress of the work is returning to England in the light cruiser *Delhi*. Naturally this country is more directly interested than any other in the disarmament of this ocean fastness. By many, the view is held that the strategic value of Heligoland, either to Germany or to ourselves, was greatly exaggerated, and the experiences of the war seemed rather to support this idea.

Heligoland served the Germans as an advanced base for destroyers and submarines and an airship station. But the value of an advanced base such a comparatively short distance from the coastal frontier did not prove of much advantage. The Germans ringed the island with mines for defensive purposes after the battle of Heligoland Bight. We did the same thing so as to bottle up the fortifications as a naval shelter, and the end of it was that the island became so perilous for either friend or foe to approach that it had a pretty dull time. The heavy artillery mounted upon it was seldom fired during the war. It was often asked why our fleet did not bombard it: The answer is that it was not worth while.

We could not possibly have done any material damage to the massive batteries without suffering injury, and probably very considerable injury, to the ships which attacked the island. Far removed as it was from the track of our sea communications, there was never any strategic reason for our vessels to approach Heligoland. Doubtless it was the most powerful sea fortress in the world, but it remained impotent throughout the war for the simple reason that we never gave its tremendous armament a chance to come into action. Whether we should have endeavoured to get into the Elbe but for this outpost astride the approach is a very moot point. The estuary to the Elbe is very strongly fortified, and our sea strategists never favoured the spectacular tactics advocated by Mr. Churchill of "routing the rats out of their holes."

Beyond affording a safe harbour, Heligoland was of very little use to Germany as a submarine base. It only brought the "U" boat flotillas two hours nearer to our northern coasts, whilst it was much more remote than Zeebrugge, Ostend, and Borkum for Channel and Atlantic depredations. As a destroyer and coastal patrol rendezvous it was probably of rather more utility. But its chief function was as an observation and wireless station, a rôle which any warship could have filled quite as effectively. We have never learnt precisely to what extent it was used as an air station. But as it only brought Zeppelins and seaplanes about half an hour nearer to any objective on this side the North Sea, the advantage in this respect was a very limited one.

Suppose Heligoland had remained in our possession on the outbreak of hostilities, what should we have done with it? Coming with such abruptness as the war did, more than likely the garrison would have been unprepared to withstand a long siege, and the navy would have had no easy task in maintaining them in the face of the efforts which the Germans would certainly have made to prevent this. The island was in no sense a necessary link in, or an obstruction to, our blockade organization. It merely served as a magnet for intensive minelaying, which would equally have happened to which ever power it had belonged.

As for the future of Heligoland, it will probably lapse into entire disuse. Its area is only the size of Hyde Park, and it cannot maintain any population without a steady flow of supplies from the mainland. The Germans have stopped the erosion of its shores by a colossal work of concrete buttresses, and they have built a magnificent harbour. But for commercial purposes this is valueless, as there is no trade to attract ships. Even fishing vessels do not use the island except for sheltering from the weather, since there is no market for their catches. In fact, it is hardly an exaggeration to say that Heligoland, dismantled as a fortress, is of no more use to Germany or any other country than the Mewstone is to Plymouth.—*Naval and Military Record*, 5 October, 1921.

GERMANS BUYING MORE SHIPS.—The following vessels delivered to the Allies have been repurchased by their original German owners:

Name	Tonnage
Badenia	6930
Erna Woermann	5528
Hersfeld	4487
Roma	2606
Rugen	1895
Tarpenbek	1871
Westfalen	5122

In addition, the White Sea Steamship Company has sold its steamer *Wolga* of 1098 gross tons to German buyers.—*The Nautical Gazette*, 18 October, 1921.

NORTH GERMAN LLOYD'S NEW PASSENGER SERVICE.—The North German Lloyd announces that it will start a regular passenger and freight service between Bremen and South America next month. The first sailing will be that of the steamship *Seydlitz* of 8008 gross tons, which carries first, second and third class passengers and will leave Bremen on November 3 next. On her outward voyage she will call at the Spanish ports Coruña, Villagarcia and Vigo. Later on the steamer *Yorck* of 8909 gross tons will be dispatched.

In addition to the above named vessels the Lloyd has the steamers *Hannover* and *Gotha* available of 9050 and 8050 gross tons respectively. It is reported that they will be put in the North Atlantic trade. The company has a number of new vessels building, some of which will be ready in the near future. One of these is the *Hindenburg* of 30,000 gross tons, a sister ship of the *Columbus* now named the *Homeric*. The *Hindenburg* is approaching completion at the Schichau Yard, Danzig.—*The Nautical Gazette*, 22 October, 1921.

HAMBURG-SOUTH AMERICAN LINE.—The Hamburg-South American Steamship Company has re-purchased from the Entente its former steamer *Santa Theresa*, of 3739 tons gross, which was to start on her first voyage to South America on October 6. For the same company the Reihersteig-Schiffswerft, of Hamburg, has just launched the 9000-ton oil-burning passenger and cargo steamer *Espana*, which, it is hoped, will be ready in January for her first voyage to Brazil and Argentina.

The same line announces the resumption on February 16 next of its express passenger service to Brazil and La Plata. Its fast 20,000-ton steamer *Cap Polonia* is scheduled to depart on that date and will be followed a month later by the *Antonio Delfino.—The Nautical Gazette*, 22 October, 1921.

HAMBURG'S MARITIME TRAFFIC.—For the first time since the war, Hamburg's maritime traffic exceeded 1,000,000 net registered tons in September last. During that month 957 vessels of 1,017,738 tons arrived. In the corresponding month of 1913 the net tonnage arriving was 1,246,556.—*The Nautical Gazette*, 29 October, 1921.

GREAT BRITAIN

NEW CAPITAL SHIPS.—*The Sunday Pictorial* learns that the specifications for the new battle-cruisers, tenders for which were lodged last Thursday, contain a clause reserving the right to the Admiralty to cancel the building at any time by paying the builders for work done.

The presence of this clause, described in the specification as "paramount," is taken to signify that the government does not intend to have its hands so tied at the Washington Conference on armaments that it could not agree to any proposal for reduction which aimed at stopping all new construction on hand.—*Naval and Military Record*, 12 October, 1921.

BATTLESHIPS AND WAGES.—Tenders for the four new capital ships were invited by the Admiralty more than month ago. In view of the magnitude of the work represented and the extreme difficulty of quoting a fixed price for any contract extending over several years at a period when the cost of labor and material is continually fluctuating, it may be some time yet before all the tenders are received. In shipbuilding circles it is felt that the Admiralty should make a departure from their customary practice by accepting bids on the cost-plus-profit basis. It this were done, each of the firms entrusted with new naval construction would receive an agreed percentage of profit on the ultimate cost of the work. The system worked well in America, where it was largely adopted in connection with war contracts. Meanwhile there appears to be much healthy competition among the ship-building and engineering firms to secure a share of the first big Admiralty contracts to be placed since the armistice. It is known that practically every firm in a position to undertake the work is preparing tenders.

Needless to say, the work people in the various shipbuilding districts have a personal stake in this matter. The allocation of one huge battle-cruiser would mean the payment in wages of millions of pounds, and the four ships together, including their machinery, armament, and equipment, will probably represent a wage bill of at least 12 millions, the disbursement of which will be spread over three years. Nor is it only in the ship-building centers that the putting in hand of the four new vessels will tend to mitigate unemployment. The manufacture of the thousands of tons of armor plate, of the main and secondary guns, and of the almost countless fittings required by a modern capital ship will keep an army of workpeople busy for a long time to come. It is, therefore, misleading to speak of naval construction as entirely non-productive. As a matter of fact, the economic situation is more likely to benefit than to suffer through our belated resumption of naval ship-building.—*Naval and Military Record*, 5 October, 1921.

NEW WARSHIP CONTRACTS.—The extracts given recently in the press of certain speeches by the Premier of New Zealand are likely to mislead. In one, Mr. Massey suggested that New Zealand would be called upon to contribute her share to the cost of building, and in another he spoke of

the new vessels as imperial ships. Of course, Mr. Massey's remarks, cabled without their context, may not have had the exact meaning ascribed to them, but in any case they seem to have been somewhat premature. The only ground in this country for the suggestion that the dominions may help to pay for the four new battle-cruisers is that contained in the speech by Mr. Lloyd George on August 18, when, in dealing with the results of the Imperial Conference, he referred to the feeling that the whole burden of defense should not be left to the Mother Country, but pointed out that the method of contribution must be left to the Parliaments of the dominions to decide, adding, "The proposals must come from themselves, and they are consulting their own Parliaments upon that particular question." It is hardly likely this passage had reference to the four new warships, which it must be remembered are merely intended as replacement ships. More reasonable is it to conclude that it referred to any future increase of the fleet if it became necessary, when the dominions might be asked to share the cost. Another source of misconception is the report that the contracts for the new battle-cruisers will provide for a cessation of work at any moment, the contractors receiving adequate compensation, so that the British representatives at the Washington Conference may be untrammelled by commitments in this respect. Here, again, the deduction is mistaken, because such a clause as this was inserted in very many contracts for munitions and war material during hostilities. The four new ships being merely to replace old ones, their construction cannot be stopped, whatever may be done at Washington, which is concerned with the future. It cannot be imagined that the British representatives to the Disarmament Conference are going there ready to cut down the British fleet even beyond a standard which the Admiralty have declared to be one involving risks to the security of the Empire.—*Army and Navy Gazette,* 22 October, 1921.

DESTROYER'S SUCCESSFUL TEST.—The *Seabear,* destroyer, last Tuesday underwent a most successful trial of her engines off Plymouth, under adverse conditions, maintaining a speed of 32½ knots at full power. The vessel was completed after the armistice, and this trial was more successful than those of any other destroyers of the *S* class which were built during the war.

The *Seabear* is one of eight of the class constructed by John Brown and Co., Clydebank. Since her completion she has been practically laid up with Devonport Reserve Flotilla, having only gone to sea for a week or so for the usual exercises. Her hull is foul, and this seriously affected the tests at a preliminary stage.—*Naval and Military Record,* 19 October, 1921.

IRELAND AND THE NAVY.—The contribution which Lord Grey, on his return to the political arena, made to the subject of the future relations of Ireland and the Empire was both weighty and timely. Many other speakers of authority have dealt at various times with the naval aspect of any settlement which may be arrived at, but the subject cannot be too often discussed or too much impressed upon the people of this country. It is indeed of vital importance that on the point of defence, an agreement which the naval authorities consider safe, practical and efficient, should be made. Whatever concessions are made during the present conference, whatever else is made the subject of bargaining, this cannot be one of them. It may be, as Lord Grey hopes, that the government are quite alive to the point, but our future security demands that there shall be no doubt about it.

The speech of Lord Grey is the more welcome because of certain misconceptions which have arisen from past utterances of some of his colleagues. Mr. Asquith, for instance, in November last, when he advocated for Ireland's "self-government in the same sense, neither greater nor less, in which it had been granted to and accepted by our great Dominions," said

that he could conceive of no motive which would lead the statesmen of a self-governing Ireland to squander any part of her meagre resources on a navy such as would be a constant menace to our shores. Yet, as Admiral Sir Cyprian Bridge pointed out, every independent or self-governing country which has a seaboard, desires to have a navy, and pretty nearly always manages to get one. He instanced the cases of Denmark, with a population of 3,000,000, and Norway, with 2,600,000, both of which nations have navies; and Chile, with less than 4,000,000, has a fleet and some very expensive ships. In fact, as the admiral picturesquely put it, a navy to many independent countries is what a dress suit is to a young man just out of his teens—a thing which he says he cannot, and certainly will not, try to do without. It costs money, but it is "the thing" to have it. So there you are! Supposing that Ireland, under a measure of self-government, should follow the example of the other great Dominions, and start a navy of her own. What then?

Lord Grey has but one stipulation to make in regard to this question, and it is one in which he will carry most reasonable men with him, viz., that the highest naval authorities at the Admiralty must be heard and their advice followed before a decision is arrived at. Mr. Asquith expressed his willingness last year to allow Ireland to start a navy, provided it was under the same conditions as those which were agreed to by all the Dominions at the Imperial Conference in 1911, which still regulate the status of the Colonial fleets. But, as Lord Grey points out, while as regards self-governing countries which are the other side of an ocean it is possible to have separate naval bases, units and authorities, he is quite sure that Great Britain and Ireland, situated as they are, cannot make the naval defence of either island sure unless that defence is under one authority. Equally as important as the actual provision of a separate Irish force is the matter of the use of Irish ports and docks. An American Admiral has spoken of the harm done during the war by Sinn Feiners who interfered with the Allied preparations. How much more harm might be done if Irish leaders were free to develop their own warships and naval ports. Even if they did not declare themselves hostile in a future conflict in which we might be engaged, they could do us untold damage by an unsympathetic attitude. It has been suggested that Bantry Bay and Lough Swilly should be made Imperial naval bases, with a zone around each under the administration of the Admiralty. The only safe plan is to take no risks, and to call into counsel those who in the school of war have learnt to appreciate those risks at their proper significance.—*Army and Navy Gazette*, 22 October, 1921.

BERMUDA.—A well-known weekly journal, which devotes considerable attention to naval and military matters, gives prominence to a suggestion from "a distinguished naval officer" on the subject of Bermuda. This says ". . . the United States would give anything in reason for Bermuda as an Atlantic fleet base. He believes she would even go so far as the whole of our indebtedness to her if we would deal. If so, why should we not?"

It cannot be expected that any proposal which involves the severance of the British Empire territory and subjects will be popular. But, apart from what is principally a sentimental view, and always presuming that the "distinguished naval officer" is correct in his surmise, the idea seems worth considering. The chief naval value of Bermuda to us lies in preventing anybody else from getting it. Otherwise the island is probably more of a liability than an asset. Such a suggestion involving any other country than the United States would be promptly vetoed. But the affinity between the two English-speaking races is of such a character as to place the idea in a category of its own.

From the purely strategic point of view it would only be reasonable to oppose the suggestion on the grounds that the United States may be a potential enemy. It is true that if we went to war with her Bermuda would

become a base of first-rate importance. But to dismiss this idea, as all sane men on both sides of the Atlantic will concur in doing, is to automatically neutralize the utility of the island to ourselves. The other western countries which bound the zone of which Bermuda is the *point d'appui* are not naval powers. Nor is it conceivable that we are ever likely to be brought into conflict with them, because the obligations which the United States assumes in consequence of the Monroe Doctrine imply responsibility on her part for their international relations.

On the other hand, the value of Bermuda as a naval base to the United States is self-evident. The island forms a natural outpost to her Atlantic zone. As to whether she would be prepared to go to the length suggested by a "distinguished naval officer" for its acquisition, this is a matter upon which it is obviously impossible for us to speculate. The subject is certainly not a new one, save in the sense in which it now crops up again. It undoubtedly takes an accentuated significance from the avowed resolve of the United States to become the dominant sea-power of the world. Our contemporary "recommends the Chancellor of the Exchequer to follow the matter up," and probably it is true to say that the mass of the tax-burdened people of this country would not be averse to seeing him do so. This is the political side of the question, however, and our interest in it, in these notes, is limited to the strategical aspects.—*Naval and Military Record*, 5 October, 1921.

NAVAL AVIATION.—We continue to receive information of a very depressing nature about the present standing and future prospects of naval aviation. If half these reports are true it would seem that the Air Ministry is still unduly favoring the army branch of flying at the expense of naval requirements. We hope that when Parliament meets some pointed questions on this subject will be addressed to the proper quarter. No secret is revealed by the statement that fleet flying work has been seriously hampered by shortage of personnel, material, and funds, though its possibilities are of enormous importance.

Officers responsible for the development of the navy's air service are confronted with the thankless task of producing bricks without straw. They are making the best of a bad job, and are able to point to what is really remarkable progress considering the means at their disposal, but all agree that the present system of a unified air service has proved a signal failure so far as the navy is concerned. Sea flying and naval aviation in general is governed by a set of conditions totally different from those that prevail in army air work. The trouble is, however, that military influence predominates at the Air Ministry, the result being that a disproportionate share of the money available is diverted to the military wing. The situation is viewed with deep misgiving by many of our best naval officers.—*Naval and Military Record*, 19 October, 1921.

THE "LION."—There is some satisfaction in the news that the *Lion*, having completed her refit, has become the flagship of Rear Admiral C. B. Miller, commanding the Rosyth Division of the Reserve fleet. This battle-cruiser, the pride of Devonport, has such a glorious war record that it would be rather sad to think of her "lying in cold obstruction," with a mere handful of people on board, whilst still a splendid fighting unit. Therefore it is pleasing to know that once again she enjoys the dignity of being a flagship.

Of course, time was—and not so very many years ago either—when our new warships, as soon as they had acquitted themselves on their trials, were passed into the dockyard reserve. The idea was to keep the latest and most formidable vessels in a state of pristine freshness as long as possible. Surprising as it now appears, it took a long while for the fallacy of this notion to be dispelled. Experience was all the time proving that a warship maintained in full commission was much more war-worthy than

a vessel of corresponding age laid at rest in a dockyard basin. Naval officers long raised a voice of protest against this procedure without any result, and it was only the lessons of successive maneuvers, with their regular crop of lame ducks amongst the specially-mobilized ships, which caused the system to be abandoned.—*Naval and Military Record*, 5 October, 1921.

FLOATING DOCKS.—Among the material that Germany was required to hand over to the Allies in accordance with the Peace Treaty were a number of floating docks, including several which had been specially built to take the largest ships of the German fleet. These have duly been delivered, and it is understood that the largest of them are being retained by the Admiralty for experimental purposes. Considering that the lifting capacity of these docks is about 39,000 tons they would appear to be a valuable acquisition, for with the solitary exception of the *Hood* all our present capital ships have a displacement considerably below this figure. If not required at home, the ex-German docks might prove useful at oversea naval bases, though even there they would have to be replaced by larger docks when the new type of capital ship, with a displacement exceeding 40,000 tons, comes into service.

When Germany first began to build dreadnoughts, which necessitated the provision of new dock accommodation at her naval ports, she decided to go in for the floating type as being cheaper and more quickly constructed than graving docks. The former are less durable, but in view of the steady and apparently unending growth of warship dimensions this was not a serious objection. It was reported just before the war that a floating dock of 50,000 tons was under design for the Germany Navy. The dock problem will certainly become urgent if the conference at Washington fails to impose a check on the development of naval armaments. The strategic requirements of the Empire will then render it necessary to provide docks of great capacity at the principal fleet bases in the Pacific, and in order to reduce expense it may be advisable to build floating docks instead of excavating dry docks. That, however, is a point which experts alone can decide. The presence in England of several big floating docks designed for the German Navy will doubtless assist the Admiralty engineers in determining the most suitable and economic type for our future needs.—*Naval and Military Record*, 12 October, 1921.

THE AIRCRAFT-CARRIER "EAGLE."—The aircraft-carrier *Eagle*, which, as the Chilean battleship *Almirante Cochrane*, was taken over by the Admiralty in the early days of the war, is rapidly approaching completion at Portsmouth Dockyard, and appointments are now being made to her in readiness for commissioning. Amongst those which have thus far been announced is Squadron-Leader F. J. Rutland. This officer, who has a very fine war record, will be in charge of that portion of the personnel and equipment which comes under the administration of the Air Ministry.

The *Eagle* herself is commanded by Captain Eric Dugmore, but although, of course, under the Naval Discipline Act he has complete jurisdiction over everybody on board, the existing system does unquestionably set up a duality of control. Air work is highly specialized, and needs specific qualifications quite as much as gunnery, torpedo, and other scientific branches. But whereas all the officers of these respective branches belong wholly to the navy, the squadron-leader is not under the Admiralty at all. The spirit of cameraderie and good sense will ensure harmonious working between the captain of the ship and the captain of the airmen; this, moreover, is not due to the system, but in spite of it.

We return to the contention that as airwork is now as much a feature of naval organization as submarine work, it should form an integral specialist branch of the sea personnel. If the *Eagle* wants more airmen, more machines, more equipment, as things are now ordered the demand has to be made through her squadron leader to the Air Ministry. Even admit-

ting that the system may work quite smoothly owing to the loyalty of the officers serving under it, what is to be argued in its favor as against the principle of direct control which would result from bringing the naval side of the Royal Air Force under the Admiralty?

Any complication of administrative methods is bound to militate against efficiency in wartime. That naval officers are quite capable of successfully specializing in aerial work was conclusively proved by the very fine service rendered by the Naval Wing of the Flying Corps during the war. This was a distinct naval unit under the Admiralty. Had it continued it would unquestionably have produced officers combining the double qualifications for commanding a ship in a fleet and acting as squadron-leaders. As things stand, it is quite conceivable that differences of opinion might arise between those who hold these distinctive appointments. The captain of the ship might consider it advantageous to place his vessel in a certain tactical position: the squadron-leader might want her somewhere else. We do not say that such a situation is very probable, but the fact that it is certainly possible reveals the defect of the existent system.—*Naval and Military Record*, 28 September, 1921.

MARRIED NAVAL OFFICERS.—The burning question of an allowance for married naval officers, similar to that paid to officers of the army and air force, would seem from certain statements in the newspapers recently to have advanced another stage. The rumors are twofold—first, that the whole matter has now gone from the Admiralty to the Treasury, and, secondly, that the allowance asked for is a consolidated one of fifty pounds per annum, irrespective of the number of children or the rank of the recipient. While it seems quite on the cards that the Admiralty have come to a conclusion on the matter, and have put their proposal forward to be considered in its financial aspect, it seems hardly possible that the second rumor can be correct. It will be two years on December 31 since the allowance paid in respect of officers' children during the war was withdrawn. Nothing has taken its place. On the other hand, as the Secretary for War stated in a speech on the Army Estimates in March last, "the State has recognized that officers over 30 and soldiers over 26 may be expected to be married, and it no longer refuses to recognize the increased responsibility that marriage brings." Admiralty officers have admitted that the matter has received favorable consideration by the board. Naturally, however, a good deal in the present day depends upon whether the Chancellor of the Exchequer will commit himself to the increased liability. While admitting that this is not the most suitable time to ask for more public expenditure, two points may be urged—one, that the Admiralty, as Admiral Sir Dudley de Chair has said, has not only since the armistice practiced the greatest economy, but has set an example to other state departments in so doing; the other, that the question must be considered in the light of its influence on the contentment and therefore the efficiency of the naval service. Once the claim of the sea officer to a marriage allowance is admitted to be just, it is putting an unfair tax on his zeal and public spirit not to meet the claim fairly. Considered in this light, it is obvious that to give £50 a year to the naval officer while his comrades in the other forces receive three or four time as much is ridiculous. More in accordance with naval custom would be a line of demarcation between commissioned and other officers, unless a further distinction is to be made and the allowances of army and air force officers are to be made contingent upon the index figures of the cost of living, while the proposed figure for the navy is to be a basic rate, irrespective of such fluctuations.—*Army and Navy Gazette*, 22 October, 1921.

R. N. R. COMMODORES.—The first award of the rank of commodore in the Royal Naval Reserve has just been made under the revised regulations

for this force. The distinction goes to Captain Charles A. Bartlett, C. B., C. B. E., who is the senior R. N. R. member of the newly-formed Advisory Committee. This grant of the rank of commodore for an indefinite period, and irrespective of the appointment held by the recipient, is something new in our naval organization, and it will be interesting to see if in time it extends to the regular list of the Royal Navy. It is the more curious that it so soon follows the abolition of the relative rank of brigadier general in the army. More than once of late years it has been suggested that all captains in the navy should be called commodore, and that all lieutenants, R. N., should be captains. Probably few of the present generation of naval officers know that the rank and title of commodore did not exist, officially, until after the battle of Trafalgar. The late Rear Admiral Sir R. Massie Blomfield, who wrote an instructive article on the subject in the *Journal of the Society for Nautical Research* in March, 1914, traced its origin to the States General and the Zealand Admiralty on the outbreak of the Dutch War in July, 1652. The title came over to us, with King William III, as "*commandeur*" (with the accent on the first and last syllables), and was vulgarized into its present form.—*Army and Navy Gazette*, 22 October, 1921.

ROYAL NAVAL RESERVE.—In view of the sympathetic interest we have always taken in the officers of the British Marine Service, it is with particular pleasure we note that a general revision of the position of the officers of the Royal Naval Reserve has been arranged. Those who have been in close touch with the subject have appreciated the dissatisfaction that has clearly existed for years past as to the conditions under which officers have served in this auxiliary service of the Royal Navy. It is no doubt due to the remarkable work done by the officers of the Royal Naval Reserve during the War which has impressed the powers that be with the necessity of clearly indicating that a unit of our fighting force which has done such valuable service is one of the claims of which cannot be disregarded. We understand that the Admiralty have decided to set up a permanent Advisory Committee which in the course of its duties will have to keep completely in touch with the general trend of opinion, with regard to the acquirement of particular knowledge affecting the Royal Naval Reserve, so as to be in a position to offer sound advice to that service, and through it generally to the Mercantile Marine. The chairman of the committee is to be the admiral commanding coastguards and reserves, who is to be assisted by such members of his staff as he may think necessary. The composition of the committee is to be of a thoroughly representative character, and will include the registrar-general of shipping and seamen, and representatives from the Chamber of Shipping and the Shipping Federation, a representative R. N. R. officer of captain's rank on the retired list, two representative R. N. R. officers of captain's or commander's rank on the active list, a representative engineer officer, R. N. R., either on the retired or active list, as may be found most suitable, a representative accountant officer, R. N. R., on the active list, and an officer on the staff of the A. C. R. to act as secretary to the committee. It is interesting to note that already Captain C. A. Bartlett has been elected as acting for the executive branch, and Mr. W. J. Willett Bruce as representative of the engineer officers. As is well known, these two prominent Liverpool officers are representative officials of the White Star Line, the former being the marine superintendent and the latter the superintendent engineer. Each has been an officer of the R. N. R. for a number of years, but both are now on the retired list. It now remains for the executive and engineering officers of the R. N. R. to further the work of the committee when fully set up by rendering every assistance and support by giving advice as to the actual conditions brought into being when the new regulations come into force, otherwise it is clear that the new committee will be unable to do justice to the important work which they have been elected to deal with. This effort on the part of the Admiralty is deserving of the greatest encouragement,

as the new move appears to us to form a direct and comprehensive means for doing away with much misunderstanding, and we might almost say injustice, with reference to complaints that have been raised from time to time in the past. The Auxiliary Service has shown itself of the greatest possible utility to the nation in the time of crisis, and on that ground alone is deserving of every reasonable encouragement which the authorities can extend to it.—*The Marine Engineer and Naval Architect,* October, 1921.

LLOYD'S RETURNS OF NEW VESSELS BUILDING.—According to Lloyd's Register of Shipping, 1475 merchant vessels of 5,542,978 gross tons were under construction on September 30 last. The showing by countries is as follows:

Countries	No.	Gross tonnage
Belgium	9	25,335
British Dominions	54	144,460
Brazil	1	2,170
China	6	15,505
Denmark	38	82,233
Esthonia	23	7,010
Finland	14	8,104
France	87	350,681
Greece	1	600
Holland	143	349,122
Italy	133	397,544
Japan	46	186,782
Norway	53	77,339
Portugal	43	17,496
Spain	17	75,017
Sweden	38	86,646
United Kingdom	700	3,282,972
United States	69	433,962
	1475	5,542,978

Vessels under construction in British yards for foreign countries were as follows:

Countries for which intended	No.	Gross tonnage
Argentine	6	8,800
British Dominions	23	82,815
Belgium	4	11,260
Chile	4	18,800
Denmark	5	19,840
France	41	223,181
Greece	4	18,920
Holland	25	211,914
Italy	3	53,000
Japan	4	25,200
Norway	35	112,814
Poland	1	1,200
Portugal	1	200
Roumania	1	3,550
Spain	9	27,460
Sweden	1	5,170
United States	3	24,400
Flag not stated	44	144,345
	214	992,869

—*The Nautical Gazette,* 21 October, 1921.

LLOYD'S INCOMPLETE SHIPBUILDING STATISTICS.—The quarterly shipbuilding returns of Lloyd's Register are being adversely criticized both here and abroad for their failure to afford a true indication of prevailing conditions in the shipbuilding trade. They reveal that, outside of Germany merchant vessels of 5,542,978 gross tons were under construction on September 30, in the various maritime countries, of which 3,283,972 tons, or almost three-fifths, were under way in the United Kingdom. But as work had been stopped on 1,563,000 tons of the total reported, the tonnage of the ships on which work is actually proceeding was only 3,980,000 tons. In other words, Lloyd's figures are so presented as to give the impression that the world's shipyards are engaged in turning out 40 per cent more tonnage than they are actually building.

For the two and one-half years preceding March last, Lloyd's statistics have reported a steady increase in the amount of work on hand in United Kingdom yards. Any one not familiar with actual conditions would have been justified in concluding from these figures that the prospects of the British shipbuilding industry were of the most roseate description. Exactly the reverse was the case, however. The gain in the amount of tonnage reported was not due to an influx of new orders, but mainly to the starting of work on old contracts which could not be undertaken during the war. What Lloyd's Register should publish is a tabulation of all new shipbuilding contracts awarded in each quarter. Such a compilation would afford a far better means of gauging the real state of the world's shipbuilding industry than the mass of figures now presented with their accompanying explanations and qualifications.

Lloyd's September returns call attention also to the continued decrease in the tonnage under construction in this country. This amounts now to 433,962 tons or only 10.5 per cent of what it was in March, 1919. Alongside of the 3,282,972 tons reported for Great Britain, America's prospective output makes but a sorry showing. It should be pointed out, however, that the figures for the United States represent work in progress, while the British total includes many suspended contracts. If this postponed construction be deducted, the British showing shrinks to 2,095,000 tons. Furthermore, the amount of tonnage completed in United Kingdom yards compares very unfavorably with pre-war times. Instead of totalling 23 per cent of the total work in hand at the beginning of each quarter as in 1913, it has only reached 8½ per cent during the first three-quarters of this year. Great Britain has a decided lead over the United States in the amount of vessel construction on hand, but it is made up largely of delayed tonnage which should have been delivered a year or so ago. Had no strikes intervened to prevent the prompt completion of ships in England, the new construction figures in the United Kingdom and this country would have been much nearer on a parity. Both in Great Britain and the United States the shipbuilding industry is suffering from a dearth of new orders and is faced with a complete standstill in the near future.—*The Nautical Gazette*, 22 October, 1921.

JAPAN

THE JAPANESE NAVY.—Many erroneous statements have been published both in Japan itself and in America concerning the Japanese naval programme. On the one hand we find newspapers in Japan solemnly asserting that the project of 1920-28 is in no sense a reinforcement of the navy, but simply a scheme for replacing obsolete material. On the other hand, a section of the American press declares the Japanese programme to be the most ambitious measure of its kind ever introduced and to represent a manifest bid for supremacy in the Pacific. In view of these contradictory interpretations, and of the fact that Japan's naval armaments are now attracting more than ordinary interest and will doubtless form one of the chief subjects of discussion at the Washington conference, the following

exposé will be read with interest. It has been transmitted to me by the Imperial Navy Department at Tokyo, which invariably shows the greatest courtesy to inquirers who apply for information through the proper channel:

It was after the Sino-Japanese war, but before the conflict with Russia, that the Imperial naval authorities realized the necessity of possessing two battle squadrons, and accordingly drew up a programme to that effect, the numbers stated being the irreducible minimum required for the defense of the Island Empire. Consequently, on the outbreak of war with Russia the Japanese Navy had two squadrons, each consisting of six capital ships, *i. e.*, six battleships and six armored cruisers. From the experience gained in that war the Navy Department resolved to form two squadrons, each comprising eight capital ships, each unit to be less than eight years old from the date of its completion. This was the inception of the so-called "8-8" scheme. Just at that time, however, there occurred a far-reaching modification in the design of capital ships, viz., the appearance of the dreadnought. This event had the effect of rendering all previous capital ships obsolete, and Japan therefore found herself faced with the necessity of building 16 vessels of the new enlarged type. Owing, however, to the financial situation, the problem became one of great difficulty and the navy was forced to be content for the time being with a building programme of 12 or 14 capital ships. This reduction, however, was well known to be merely temporary, and the ultimate aim of placing in commission a fleet of 8-8 ships was repeatedly announced in both Houses of Parliament.

The 1920-28 Programme was sanctioned by the Imperial Diet in July, 1920, and when the previous and present schemes are completed Japan will be in possession of a fleet having 16 capital ships of the first class. This establishment will be reached at the end of March, 1928. The programme sanctioned 14 months ago embraces the following new construction: Battleships, 4; battle cruisers, 4; cruisers, 12; destroyers, 32; gunboats, 5; fleet auxiliaries, 18; and a certain number of submarines.

The remaining eight ships to be included in the 8-8 fleet had previously been authorized. They are the battleships *Nagato, Mu'su, Kaga,* and *Tosa,* and the battle cruisers *Amagi, Akagi, Atago,* and *Takagi.* The two last-named are not yet begun, but preparations are in hand for laying their keels early next year.

To the foregoing official statement I may add some remarks contained in a letter which I received last June from a Japanese naval officer who is well known and highly esteemed in this country. "Judging by what appears in the press," he wrote, "one would suppose that Japan and the United States were building their war vessels against each other. This, however, is not the case. Our present naval scheme was originated as early as the year 1906, that is, just after the Russo-Japanese war, in accordance with the tactical opinion of our naval experts. During that war the United States of America gave us every possible assistance, and there could be no possible reason for imagining that our naval scheme was directed against the United States. The current American naval programme was, as you are no doubt aware, authorized in 1916, just before they entered the Great War. I cannot believe that it was put forward with any idea of competing with Japan at that moment. Most probably the Americans took a broader and finer view of the matter. Present naval construction both in the United States and Japan is, therefore, merely following out the old schemes laid down by the respective governments. At the present time no other country is building capital ships, and thus the idea has taken root that the two powers which are building such ships must naturally be building one against the other!"

The latest mail advices indicate that the labor dispute in the Kobe shipbuilding yards was settled rather more than a month ago. No fewer than 40,000 men had been idle for nearly six weeks, and, although there were one or two collisions between the strikers and the police, which resulted

in bloodshed, the dispute on the whole was conducted with exemplary moderation on both sides. The two principal yards affected were the Kawasaki and the Mitsubishi. At the former yard work was suspended on the battleship *Kaga*, which is still on the stocks, and on the light cruiser *Oh-i*, which is fitting out for sea. The *Kaga* was to have been launched on September 22, but she is not now expected to take the water before the end of this month (October). At the Kawasaki establishment the building of a considerable number of small war vessels has been delayed by the strike, among them being submarine *No. 27* and several destroyers. At no time during the labor conflict was any act of sabotage attempted against the warships building and completing in the yards.

Submarine *No. 24*, one of the newly-completed big ocean-going boats, had a narrow escape from destruction on July 19. While lying in Hiroshima Bay a fire broke out in the galley and spread to the adjoining torpedo room. Early efforts to extinguish the flames were unsuccessful, and they were not mastered till several compartments had been flooded. There were fortunately no casualties, but the damage to the interior of the boat is very serious, and will take a month or two to make good. On August 8 a less serious accident occurred to the *Fuso*, a battleship of the First Squadron, under the command of Admiral Tochinai. While engaged in night maneuvers outside the Bay of Sahegi she damaged her starboard propeller by striking a rock or some other obstruction, and was compelled to return to Kure for repairs. The *Fuso* seems to be an unlucky ship, for a month or two previously a large proportion of her company had been down with dysentery.

I am officially informed that the ships of the Japanese Navy in full commission are now distributed as follows:

First Squadron, comprising 3 dreadnoughts, 3 pre-dreadnoughts, 1 cruiser, and 16 destroyers.

Second Squadron, comprising 2 battle cruisers, 1 cruiser, 10 destroyers, 1 coast defense ship, and 4 submarines.

Third Squadron, comprising 3 pre-dreadnoughts, 3 cruisers, 6 destroyers.

In addition there are three cruiser squadrons abroad, viz:

In Chinese waters—1 cruiser and 5 river gunboats.

In southern waters—2 cruisers.

Training Squadron—2 cruisers.

Several old vessels are retained in commission as tenders to the various schools or for purposes of harbor defense. All other vessels are in reserve. Generally speaking, one-half of the vessels of the navy are in commission, while the remainder are in reserve.—*Naval and Military Record*, 5 October, 1921.

UNITED STATES

TRIALS OF FIRST ELECTRIC COAST GUARD CUTTER.—The official sea trials of the *Tampa*, the first of four electrically propelled coast guard cutters to be placed in service by the Treasury Department, have been completed off the Pacific Coast with entire success.

The *Tampa* was built by the Union Construction Co., Oakland, Cal., and the electrical apparatus was furnished by the General Electric Co. She is 240 feet long with a beam of 39 feet and a displacement of 1600 tons. Her contract speed of 16 knots was exceeded during the trials.

The main propulsion equipment consists of two oil burning water tube boilers and a Curtis turbine directly connected to an A. C. generator supplying electric power to a 2600 h. p. synchronous motor giving a propeller speed of 130 r. p. m.

The control equipment consists of a control group and a panel, so arranged that it can be either operated electrically or in case of an emergency, by hand. Two exciters, one being a spare unit, furnish current for the excitation of the generator and synchronous propulsion motor and also power for driving various auxiliaries, such as the blower motor, steering gear, the gypsy, refrigerating plant, laundry and lighting equipment.—*The Nautical Gazette*, 22 October, 1921.

NAVY DEPARTMENT—BUREAU OF CONSTRUCTION AND REPAIR

VESSELS UNDER CONSTRUCTION, UNITED STATES NAVY—DEGREE OF COMPLETION, AS REPORTED OCTOBER 31, 1921

Type, number and name	Contractor	Per cent of completion			
		Nov. 1, 1921		Oct. 1, 1921	
		Total	On ship	Total	On ship
Battleships (BB)					
45 Colorado	New York S. B. Cpn.	83.0	81.6	80.7	79.2
47 Washington	New York S. B. Cpn.	69.8	63.6	69.7	63.5
48 West Virginia	Newport News S. B. & D. D. Co.	64.0	57.3	62.5	55.5
49 South Dakota	New York Navy Yard	35.2	27.7	34.6	27.
50 Indiana	New York Navy Yard	33.2	35.1	32.5	24.3
51 Montana	Mare Island Navy Yard	27.6	19.	27.6	19.
52 North Carolina	Norfolk Navy Yard	36.7	27.1	36.6	27.1
53 Iowa	Newport News S. B. & D. D. Co.	29.9	25.5	29.5	25.
54 Massachusetts	Beth. S. B. Cpn. (Fore River)	10.4	3.9	10.4	3.9
Battle Cruisers (CC)					
1 Lexington	Beth. S. B. Cpn. (Fore River)	26.7	17.8	25.5	16.5
2 Constellation	Newport News S. B. & D. D. Co.	15.5	13.7	14.5	12.6
3 Saratoga	New York S. B. Cpn.	29.4	22.2	28.4	20.
4 Ranger	Newport News S. B. & D. D. Co.	2.9	1.2	2.7	1.1
5 Constitution	Philadelphia Navy Yard	11.7	6.8	11.1	6.3
6 United States	Philadelphia Navy Yard	11.1	6.2	10.7	5.9
Scout Cruisers (Light Cruisers CL)					
4 Omaha	Todd D. D. & Const. Cpn.	96.8	89.6	94.7	87.9
5 Milwaukee	Todd D. D. & Const. Cpn.	93.7	86.3	92.5	84.6
6 Cincinnati	Todd D. D. & Const. Cpn.	87.4	80.8	87.4	80.8
7 Raleigh	Beth. S. B. Cpn. (Fore River)	63.7	45.6	63.7	45.6
8 Detroit	Beth. S. B. Cpn. (Fore River)	71.6	54.1	68.5	50.6
9 Richmond	Wm. Cramp & Sons Co.	78.	70.	74.	64.
10 Concord	Wm. Cramp & Sons Co.	71.	60.	68.	53.
11 Trenton	Wm. Cramp & Sons Co.	52.	39.	51.	35.
12 Marblehead	Wm. Cramp & Sons Co.	47.	33.	46.	30.
13 Memphis	Wm. Cramp & Sons Co.	40.	26.	40.	25.
Auxiliaries					
Repair Ship No. 1, Medusa (AR 1)	Puget Sound Navy Yard	70.6	56.7	69.3	53.9
Dest. Tender No. 3, Dobbin (AD 3)	Philadelphia Navy Yard	66.4	66.1	66.3	66.
Dest. Tender No. 4, Whitney (AD 4)	Boston Navy Yard	36.8	33.3	34.9	31.1
Sub. Tender No. 3, Holland (AS 3)	Puget Sound Navy Yard	21.5	5.5	21.5	5.5
Aircraft Tender, Wright (AZ 1)	Tietjen & Lang	96.	....	92.	.....
Patrol Vessels					
Gunboat No. 22, Tulsa (PG 22)	Charleston Navy Yard	71.1	55.7	70.8	54.5
Destroyers					
338 Wasmuth	Mare Island Navy Yard	99.7	99.7	99.5	99.5
339 Trever	Mare Island Navy Yard	97.7	97.7	97.5	97.5
*340 Perry	Mare Island Navy Yard	79.5	78.8	75.3	74.5
†341 Decatur	Mare Island Navy Yard	73.7	63.0	70.2	69.4

* Destroyer 340, Perry, launched 29, Oct. 1921.
† Destroyer 341, Decatur, launched 29, Oct. 1921.

In addition to the above there are under construction 4 fleet submarines and 37 submarines.

Authorized but not under construction or contract 6 fleet submarines and 1 submarine.

PACIFIC FLEET BASES.—The proposition, advanced in a recent book on the Pacific question, that modern fleets cannot undertake long-range operations with effect unless they possess properly-equipped bases at a reasonable distance from the scene of such operations, and that consequently the United States Navy will not be in a position to defend the Philippines until it has a near-by base where it can bunker and carry out urgent repairs, has been generally accepted in naval circles. That the overwhelming importance of base power in the Far Pacific is realized by American naval students is evident from the marked attention which this subject is now receiving. A contributor to one of the American service periodicals has dealt with the question in a very outspoken fashion. He lays emphasis on the mental strain to which a commander-in-chief would be subjected were he compelled to go into action knowing that injury to his ships could not be made good at a base near at hand, or that, if they were to be repaired, the work would deprive him of important units of the fleet for longer periods than he could spare them. The writer declares this question to be of supreme importance to the efficient conduct of the campaign and the victorious use of the fleet. "The necessity for dry docks, capable of taking our largest ships, in the distant bases is ever present, and so great is the need that war might find us totally unprepared in this vital respect unless we start at once to build such docks."

Where immense stretches of ocean separate a fleet from its home stations there must be repair shops, docks, and supplies of all kinds at other points than on the home coast if the fleet is to keep the seas. The United States, holding valuable naval bases in the Pacific, has not secured her hold on them to the extent that would make their use by her naval forces an assured fact in time of war. The result is that she might have to inaugurate a campaign by endeavoring to retake from the enemy what she had held for many years but had neglected to fortify and protect against capture. These arguments, cogent though they be, have apparently failed to convince American legislators, for it transpires that the Navy Department's plans for developing fleet facilities in the Western Pacific have been either rejected or so whittled down as to be hopelessly inadequate.—*Naval and Military Record,* 19 October, 1921.

NEW SUBMARINE POWER DEVELOPED.—A new type of submarine motive plant, comprising a combination of gas and electric propulsion, will be installed in three American submarines of the *V* type, two of which have just been laid down at the Portsmouth, N. H., navy yard. Naval engineers are said to be watching construction with great interest because of their expectation of improved operation of submersible warcraft to result from the new installation. A cruising radius of 10,000 miles is said to be one possibility.

The latest submarines are to be 2025-ton boats, measuring 300 feet in length and equipped with electric engines of 6500 horsepower. They are designed for a surface speed of twenty-one knots, and a submerged speed of from nine to ten knots an hour. The power plant will combine the latest engineering developments resulting from experiments conducted on the naval collier *Jupiter,* now the aircraft carrier *Langley.*

The two main engines, set well astern, of 2250-horsepower each, are of the six-cylinder type, and are connected with two motor generators which will drive two propellers. Two engines of the same type, of 1000-horsepower each, are located forward, and are connected directly with the generators, which, through two rear electric motors, will drive the submarine at an economical surface cruising speed of eleven knots. By combining the main and forward plants a maximum of 6500 horsepower will be obtained. When under water the submarines will be driven by the aft motors from batteries and no gas engines will be run.

Interesting features of the gas engines include the use of the aft motor generators somewhat as are electric self-starters in automobiles. The twelve engines for the three submarines are said to have cost $3,000,000.

It is estimated by submarine experts that those vessels will be able to operate for a month away from their bases, or tenders, and that the maximum cruising radius at an average speed is approximately 10,000 miles. Those estimates indicate that the submarines will be able, as designed, to accompany naval fleets on long cruises.

The crews of those ships will include four officers and about fifty men, an increase of twenty men over those of the underwater craft now in the United States services.

When completed in 1923 the new submarines will be armed with one five-inch gun, set in a "wet" mount forward of the conning tower. The gun is designed to remain in the water when submerged, and can be trained almost in a complete circle or relayed as an anti-aircraft weapon. Machine guns will be mounted on the conning tower bridge. Forward will be four torpedo tubes and aft two others, all of the 21-inch size. Storage space is planned for sixteen torpedoes.—*Philadelphia Public Ledger*, 9 November, 1921.

COMPARISON OF NAVAL STRENGTH.—As a starting point for any limitation or reduction of naval armaments a clear idea of present relative strength is essential. This is not altogether subject to exact ascertainment. Naval strength, while based on known facts, is to some extent a matter of opinion. With warships of widely varying types and characteristics, various sizes and various ages, there is always room for argument when an attempt is made to compare the total fighting value of any two navies.

A comparison of guns alone can be made on the basis of caliber, of weight of projectiles, of range, of muzzle velocity, of flatness of trajectory, of rapidity of fire and of length of life. Guns are but one element of a battleship, however, which, in addition, should have defensive armor, under-water protection, speed, great radius of action, and a host of minor but desirable characteristics. All this, moreover, concerns only the individual ship. Every navy is composed of a multitude of ships, of every size, class, type, age and purpose. To be of any value in time of war, each of these ships must be manned by a thoroughly trained crew.

In this complexity it is no wonder that the average citizen seeks for some simple standard of comparison. Too often, however, this leads to undue emphasis upon some one particular feature. The two elements which seem to bulk largest in the popular mind are the caliber of the gun and the speed of the ship.

As to the first, there are those who would never spend money to put 16-inch guns on ships for fear some other nation will retort with 18-inch. No consideration is given to the fewer number which it would be possible to mount on a given size of hull or to the enormous increase in size and cost necessary to keep the same number of the heavier guns. The increase of two inches in the caliber of the 16-inch guns of the *South Dakota*, as compared with the *California*, meant an increase in displacement from 32,300 to 43,200 tons. The extra cost involved ran into the millions. Bigger guns may come with the progress of naval science, but the task of making your neighbor's ships "obsolete" by the simple process of mounting a larger gun is by no means as easy as it looks.

Speed is another spectacular feature of a ship, but in the case of heavy battleships its importance may easily be exaggerated. Wars are not won by running away from an enemy, and even the ability to catch an enemy who elects to run instead of fight is of secondary importance. Wars are won on sea as well as on land by the ability to seize positions of strategic importance, and to hold them against any force that may be brought to bear. "War," says Mahan, quoting Napoleon, "is a business of positions." Every one recognizes that on land the slow-moving infantry is the dominant factor, however necessary may be its more mobile auxiliaries. The same characteristics should not be sacrificed in ships meant to perform the same function, and extreme speed can be purchased only at the cost of other fighting qualities.

Every battleship is a compromise. Upon a given displacement, or total weight, the more guns you have, the less you have left for armor; the bigger the guns the fewer they must be. Speed is a direct function of the proportion of the total weight and space you are willing to allot to boilers and machinery; the radius of action is likewise dependent on the number of tons of fuel allowed. No one of these can be over-emphasized except at the expense of all the rest.

Herein lies the hint of the first and most important standard of comparison. The total displacement or weight of a battleship is the sum of all its desirable qualities. Displacement costs money, the more displacement you put at the service of the naval designer the better ship you will get.

It is not that size is a virtue in itself. The increased size and weight of the hull, together with the additional target it offers, are the disadvantages of bigness. The increased weight of the hull alone, however, is not in proportion to the increase in total displacement, and the increase in size puts so much more weight at the disposal of the designer to be used in the four fighting qualities, guns, armor, speed and endurance, that it is an axiom that the bigger the ship the better fighter it will be.

Twenty years ago there were many advocates of moderate displacement of individual ships on the theory that if a nation has so much money to put into battleships it were better distributed in more units of small size than concentrated in larger units. It is doubtful if the fundamental postulate is sound—that is, that a nation has a fixed sum to put into naval construction. Apart from this, not much is now heard in favor of small units. On the contrary, naval experts are convinced that the fighting value of a ship increases very nearly as the square of the displacement. The bigger hull not only permits the mounting of more heavy caliber guns, but the carrying of heavier armor, additional stiffening for underwater protection against torpedoes and more boilers for speed. It is the general acceptance of this principle that accounts for the abrupt increase in size, and incidentally in cost, from the British *Renown* of 26,500 tons to the *Hood* of 41,200 tons, promptly followed by our increase from the *Maryland* class of 32,600 tons to the *South Dakota* class of 43,200 tons and by Japan from the *Nagato* class of 33,800 tons to the *Kii* class of 43,500 tons. If this tendency is not checked by agreemnt at the conference we may soon look for monsters whose only limit is the 1000-foot length of the locks of the Panama Canal. It may be remarked, parenthetically, however, that as long as naval building is allowed to remain a competitive race, high cost is no disadvantage, since one main object of such a race is to make it too expensive for other nations to compete. Potential enemies who could seriously contest the supremacy of the sea with the United States have greatly diminished since we had trouble with Chile over the *Baltimore* incident, or since we fought Spain on substantially equal terms so far as our navies looked on paper. We have at least got something for our money.

Taking total displacement as a rough approximation of the strength of a navy, we have the following table:

TABLE I.—FIGHTING SHIPS OF ALL KINDS

	Built		Building and Authorized	
	No.	Tons	No.	Tons
Great Britain	533	1,860,480	17	215,380
United States	464	1,289,463	69	734,928
Japan	99	528,698	85	805,188
France	138	462,356	34	91,230
Italy	86	275,622	21	19,928

This is a rough yardstick indeed. The unreliability of counting units, by which a destroyer equals a dreadnought, is manifest. Even a comparison of total displacement gives no hint as to what proportion is given up

to light cruisers, submarines and destroyers and what proportion is in capital ships. A nation not intending seriously to contest the supremacy of the sea, will naturally put a greater proportion into defensive types.

Another factor that greatly modifies a comparison of displacements is the factor of age. The table above is compiled by drawing a dead line at 20 years from the launching of large vessels and 15 years for torpedo craft. Within these limits, however, there must still be considerable allowance for obsolescence. It is not so much that the ship itself deteriorates with age as it is the relative deterioration from improvement in design and construction. In this sense, age, like displacement, covers a multitude of details. Naval construction is a progressive science. Improvement in guns, armor, machinery, and hull construction are made constantly, so the sum total of these is a factor of considerable importance.

This can perhaps be best illustrated to the average citizen by the analogy between the progress in designing and building battleships and the progress in designing and building automobiles. The multitude of improvements, large and small, which makes the motor of to-day a more efficient machine than the motor of fifteen or twenty years ago, finds a close parallel in the corresponding progress in a naval construction.

The notion that a battleship "is obsolete before it is launched," or in a short time thereafter, is, however, fallacious. Successive designs, plus the willingness of legislators to increase the cost of units, may show substantial progress from year to year but it is only once in a generation that there is a revolutionary advance such as the monitor or the dreadnought. Otherwise improvement is gradual. A battleship fifteen years old may show at a disadvantage compared with her sister of to-day, but the older ship is not expected to fight the new one individually. Battleships act in fleets, and our earliest dreadnoughts are still effective units against a fleet which likewise must contain ships of its own age and size.

Ships may be classified as dreadnoughts, pre-dreadnoughts, battle cruisers, armored cruisers, etc., with reasonable exactness, though the classes sometimes merge in a way to give the captious full opportunity to dissent from the individual classification of many border line ships. Recent classifications divide ships within the age limit into "first line" and "second line" accordingly as they are strictly modern or obsolescent. The Navy Department's standard for a first line battleship is that it shall carry at least ten guns of 12-inch caliber or larger and displace at least 20,000 tons. A first line battle cruiser must carry 13.5-inch guns or larger and have a speed of at least 27 knots. A table compiled on this basis would show the following number of vessels of the larger types.

TABLE 2

	Great Britain		United States		Japan	
	Built	Bldg.	Built	Bldg.	Built	Bldg.
Battleships, first line.....	26	0	18	6	6	7
Battle cruisers, first line..	6	4	0	6	4	8
Battleships, second line...	6	0	15	0	4	0
Battle cruisers, second line	4	0	0	0	0	0
Cruisers, first line.....	2	0	0	0	0	0
Cruisers, second line.....	4	0	10	0	5	0
Light cruisers, first line...	45	4	0	10	9	14
Light cruisers, second line.	14	0	3	0	1	0

It will noted that the main table includes the factors of number of capital ships, relative age, strength of main batteries and displacement. While it thus gives a general idea of relative strength in visual form, it further illustrates the difficulty of exact comparison.

As between Great Britain and the United States, for example, it is hard to compare the older ships of the Mother Country with our modern ships still under construction. With both programs finished, and barring the further scrapping threatened by Great Britain, the tonnage in capital ships will be practically identical. Under these circumstances our larger proportion of "post-Jutland" ships should give us a margin of superiority, even with 33 vessels against 45. Great Britain's overwhelming superiority in cruisers and airplane carriers, not shown on the table of capital ships, is, however, an item not to be disregarded.

With Japan age conditions are reversed. We excel in older ships, but the margin rapidly decreases with more modern construction. The *Settsu* is the only vessel old enough to carry 12-inch guns as against six of our earlier dreadnoughts. Following this Japan built four battleships and four battle cruisers, giving her eight ships armed with 14-inch guns, as against eleven American battleships. The "post-Jutland" program of both countries call for sixteen vessels, each armed with 16-inch guns. Our "three-year program," adopted in 1916, will give us ten battleships and six armored cruisers. Japan's "eight-eight" program as the name implies, calls for an equal number of each type. Japan's last four battle cruisers are not yet laid down, but her budget calls for their completion before 1928. Twelve of our sixteen are proceeding under reduced appropriations, the battleship at about 25 per cent of capacity speed and the battle cruisers at about 50 per cent, and their date of completion is officially designated as "indefinite."

In grand total Japan will have 76 per cent of our number of capital ships in a fleet at least 2 knots faster and 83 per cent of our capital strength measured in tonnage. Her fleet is, of course, superior to either our Atlantic or Pacific fleet taken separately. If strategic conditions in the Pacific are to be taken into consideration, the heavy disadvantage of either fleet's being compelled to fight on the opposite side of the ocean without adequate bases must be given considerable weight in a comparison of material strength.

Not only does the greater proportion of battle cruisers in the Japanese Navy make for a swifter fleet, but the battleships themselves are 2 knots faster than ours. The standard speed of our dreadnoughts is 21 knots, with our first oil burners, the *Oklahoma* and *Nevada*, designed for half a knot less. Except for the *Settsu*, the Japanese battleships are designed for 23.5 knots. We have now laid down the *South Dakota* class of 23 knots, but Japan, with the *Kaga* and *Tosa*, has gone up to 25 knots. Tactically therefore the Japanese fleet is in position to fight or to refuse at will, always remembering, however, that wars are not won by refusing to fight.

Great Britain's standard speed is the same as ours. The *Queen Elizabeth* class of five ships is a fast squadron of 25 knots, but following this the Royal Sovereigns went back to 21 knots. It must be remembered, however, that every ship Great Britain has laid down since the war, including two altered during construction, has been of the powerful intermediate type of the *Hood*. These ships have a speed in excess of 30 knots and are officially classed as battle cruisers.

After all, however, a navy is not merely a collection of machines. Ships must have men to man them, and modern fighting ships must have crews which are thoroughly trained. Once in our history we sent a frigate manned by a green crew to meet one manned by a seasoned crew, and the crowd which gathered on the headlands to witness the fight saw the *Shannon* tow away the defeated *Chesapeake*. We do not want to repeat this on a large scale, yet at present every new battleship put in commission means the laying up of an older one—not the predreadnought long since in reserve, but one of the dreadnoughts listed in the main table.

To get back to actual comparisons, Great Britain has 123,700 regularly enlisted men and 10,158 officers at present in her navy. Japan has 68,800

CAPITAL SHIPS OF THREE LEADING POWERS

(Dreadnoughts in Capitals, Battle Cruisers (B. C.) in Small Letters)

Laid down	Great Britain			United States			Japan		
	Name	Main battery	Displacement	Name	Main battery	Displacement	Name	Main battery	Displacement.
1905-06	Indomitable (B. C.).....	8 12-in.	17,250						
	Inflexible (B. C.).....	8 12-in.	17,250						
1906-07	BELLEROPHON.....	10 12-in.	18,600						
	TEMERAIRE.....	10 12-in.	18,600						
	SUPERB.....	10 12-in.	18,600						
1907-08	ST. VINCENT.....	10 12-in.	19,250	DELAWARE.....	10 12-in.	20,000			
	COLLINGWOOD.....	10 12-in.	19,250	NORTH DAKOTA..	10 12-in.	20,000			
1908-09	NEPTUNE.....	10 12-in.	19,900	UTAH.....	10 12-in.	21,825	SETTSU.....	12 12-in.	20,800
				FLORIDA.....	10 12-in.	21,825			
1909-10	COLOSSUS.....	10 12-in.	20,000	WYOMING.....	12 12-in.	26,000			
	HERCULES.....	10 12-in.	20,000	ARKANSAS.....	12 12-in.	26,000			
	ORION.....	10 13.5-in.	22,500						
	CONQUEROR.....	10 13.5-in.	23,500						
	THUNDERER.....	10 13.5-in.	22,500						
	MONARCH.....	10 13.5-in.	22,500						
	Lion (B. C.).....	8 13.5-in.	26,350						
	Princess Royal (B. C.)...	8 13.5-in.	26,350						
	New Zealand (B. C.).....	8 12-in.	18,800						
	Australia (B. C.).....	8 12-in.	18,800						
1910-11	KING GEORGE V.....	10 13.5-in.	23,000	TEXAS.....	10 14-in.	27,000	Kongo (B. C.)....	8 14-in.	27,500
	CENTURION.....	10 13.5-in.	23,000	NEW YORK.....	10 14-in.	27,000			
	AJAX.....	10 13.5-in.	23,000						
	ERIN.....	10 13.5-in.	23,000						
1911-12	IRON DUKE.....	10 13.5-in.	25,000	OKLAHOMA.....	10 14-in.	27,500	Hiyei (B. C.).....	8 14-in.	27,500
	MARLBOROUGH.....	10 13.5-in.	25,000	NEVADA.....	10 14-in.	27,500	Kirishima (B. C.).	8 14-in.	27,600
	EMPEROR OF INDIA..	10 13.5-in.	25,000				Haruma (B. C.)..	3 14-in.	27,600
	BENBOW.....	10 13.5-in.	25,000				FUSO.....	12 14-in.	30,600
	AGINCOURT.....	14 12-in.	27,500						
	Tiger (B. C.).....	8 13.5-in.	28,500						
1912-13	QUEEN ELIZABETH..	8 15-in.	27,500	PENNSYLVANIA..	12 14-in.	31,400			
	WARSPITE.....	8 15-in.	27,500						
	VALIANT.....	8 15-in.	27,500						
	BARHAM.....	8 15-in.	27,500						
	MALAYA.....	8 15-in.	27,500						

	BARHAM	8 15-in.	27,500						
	MALAYA	8 15-in.	27,500						
1913-14	RAMILLES	8 15-in.	25,750	ARIZONA	12 14-in.	31,400	YAMASHINO	12 14-in.	30,600
	RESOLUTION	8 15-in.	25,750				ISE	12 14-in.	31,260
	REVENGE	8 15-in.	25,750				HYUGA	12 14-in.	31,260
	ROYAL SOVEREIGN	8 15-in.	25,750						
	ROYAL OAK	8 15-in.	25,750						
1915-16	Renown (B. C.)	6 15-in.	26,500	NEW MEXICO	12 14-in.	32,000			
	Repulse (B. C.)	6 15-in.	26,500	IDAHO	12 14-in.	32,000			
				MISSISSIPPI	12 14-in.	32,000			
1916-17	Hood (B. C.)	8 15-in.	41,200	CALIFORNIA	12 14-in.	32,300	NAGATO	8 16-in.	33,800
				TENNESSEE	12 14-in.	32,300	MUTSU	8 16-in.	33,800
				MARYLAND	8 16-in.	32,600			
Authorized and building	Anson (B. C.)	?	44,000	COLORADO	8 16-in.	32,600	KAGA	8 16-in.	40,600
	Howe (B. C.)	?	44,000	WEST VIRGINIA	8 16-in.	32,600	TOSA	8 16-in.	40,600
	Rodney (B. C.)	?	44,000	WASHINGTON	8 16-in.	32,600	KII	12 16-in.	43,500
	No. 4 (B. C.)	?	44,000	Lexington (B. C.)	8 16-in.	43,500	OWARI	12 16-in.	43,500
				Constallation (B. C.)	8 16-in.	43,500	No. 7	12 16-in.	43,500
				Saratoga (B. C.)	8 16-in.	43,500	No. 8	12 16-in.	43,500
				Ranger (B. C.)	8 16-in.	43,500	Amagi (B. C.)	8 16-in.	44,000
				Constitution (B. C.)	8 16-in.	43,500	Akagi (B. C.)	8 16-in.	44,000
				United States (B. C.)	8 16-in.	43,500	Atago (B. C.)	8 16-in.	44,000
				SOUTH DAKOTA	12 16-in.	43,200	Takao (B. C.)	8 16-in.	44,000
				INDIANA	12 16-in.	43,200	No. 5 (B. C.)	8 16-in.	44,000
				MONTANA	12 16-in.	43,200	No. 6 (B. C.)	8 16-in.	44,000
				NORTH CAROLINA	12 16-in.	43,200	No. 7 (B. C.)	8 16-in.	44,000
				IOWA	12 16-in.	43,200	No. 8 (B. C.)	8 16-in.	44,000
				MASSACHUSETTS	12 16-in.	43,200			

Summary Three Leading Powers

	Great Britain		United States		Japan	
	Built	Building	Built	Building	Built	Building
Dreadnoughts	31	0	18	9	7	6
Battle cruisers	10	4	0	6	4	8
Total capital ships	45		33		25	
Total capital tonnage	1,143,450		1,118,650		929,520	
PERCENTAGE STRENGTH COMPARED WITH UNITED STATES						
Capital ships	136%		100%		76%	
Capital tonnage	102%		100%		83%	

men and 7430 officers, with provision for increase with the commissioning of new ships up to a maximum of 140,000 men at the completion of her "eight-eight" program. The United States has at present 106,000 men and 8727 officers, with no provision for increase with the completion of our "three-year" program. France has 50,000 men and 3730 officers. Both Great Britain and Japan have a more numerous and better organized reserve than has the United States.

Taken as a whole, therefore, Great Britain is now well in the lead. Upon the completion of the programs now under way the United States, with substantially the same tonnage will have a slight superiority due to the larger number of modern vessels. Japan's navy will be about 80 per cent of the strength of either of the others. This disparity, however, is principally in older ships so that, for example, if vessels carrying 12-inch guns should be considered obsolescent by the time all ships now authorized were finished, and comparison of capital ships confined to 13.5-inch, 14-inch and 16-inch guns, Japan's relative strength would be substantially increased. Any closer comparison involves such a complexity of factors as to resolve itself merely into a matter of opinion. France and Italy are not in the race to maintain supremacy in sea power.

There will undoubtedly be many and diverse plans for the limitation of naval armaments offered at the conference. Nations with a present superiority will naturally seek to maintain their relative strength, which, as has been pointed out, is no easy matter to ascertain for the present or to determine for the future. We may expect nations at present inferior in strength to suggest equality of armament as the logical corollary of the equality of nations. The Japanese press has been very insistent on this point and echoes in the American press have not been lacking to the effect that the spirit of the conference would be violated by any attempt of the powers now in the lead to maintain the existing relationship. Another suggestion that has been made is to limit the size as well as the number, of ships. Those nations who can make their money go farther than others will wish to solve the problem in terms of comparative expenditures or annual budgets, that is by comparing money instead of material. To find a satisfactory solution is going to tax the statemanship of the world.—*Washington Post*, 16 October, 1921.

FREE CANAL TOLLS VOTED.—By a vote of 47 to 37, the Senate on Monday last passed the Borah bill exempting American ships in the coastwise trade from the payment of Panama Canal tolls. The measure now goes to the House where it will probably encounter long delay as President Harding desires to have action deferred on this controversial subject until the Conference on the Limitation of Armaments is ended.

During the debate on the measure Senator McCormick of Illinois said that free tolls would discriminate in favor of the agricultural and industrial interests of the Atlantic and Pacific coasts and against those of the Middle Western States and would mean higher freight rates for the Middle West. Senator Lodge contended that the matter should go to arbitration and that the United States was open to the implication of bad faith in making use of its legal right to pass its vessels through the Canal free of tolls.

In the fiscal year ended June 30, 1921, American coastwise vessels using the Canal paid tolls of $1,451,477.—*The Nautical Gazette*, 22 October, 1921.

FOREIGN SHIPS EXCLUDED FROM MEXICAN COASTWISE TRADE.—American Vice-Consul Stephen E. Aguirre reports that a recent decree, effective August 1, 1921, provides that foreign ships other than those flying the Mexican flag will not be permitted to engage in coastwise trade between Mexican ports. The reason for such a decree is given as an attempt to stimulate Mexican shipping. The enforcement of the new decree will

undoubtedly affect small foreign shipping now making regular calls, particularly those vessels calling at points on the west coast.

It is generally believed that such ships will change their flag in order to engage in Mexican coastwise trade. Large American freight and passenger vessels will be little affected since their cargoes originate outside Mexican ports and the cargoes taken on are destined for ports in the United States.

The decree has been strictly enforced in western and lower California ports and has seriously affected trade on the Pacific coast. As there are but few roads in this part of Mexico, all freight is sea borne, and before August 1 these ports were served by small American vessels. These boats usually sailed from California ports and entered at Ensenada, La Paz, and other Lower California ports, then continued to the ports on the Mexican mainland, and again touched the ports of the peninsula on their return trip.—*The Nautical Gazette*, 22 October, 1921.

VESSELS SOLD TO FOREIGNERS.—With the consent of the Shipping Board 10 American vessels of 9416 gross tons were transferred to foreign flags during September. All but four of these craft passed into British ownership. The largest vessel sold was the motorship *Balcatta* of 3109 tons, which is now under the French flag.—*The Nautical Gazette*, 22 October, 1921.

BOARD'S PHYSICAL ASSETS SHRINK IN VALUE.—The commission appointed to make a complete survey of the Shipping Board's physical assets aside from its steel ships reports that this property cost $389,700,000. The surplus supplies and materials on hand cost $124,884,000, and are now appraised at $35,400,000. Other items in which large decreases in value were shown are:

Shipyard equipment, land, buildings and drydocks—original cost $117,000,000; present value $22,437,000.

Uncompleted wooden hulls—cost $58,475,000; present value $199,000.

The Emergency Fleet Corporation has removed all restrictions and limitations on the sale of its surplus supplies. To facilitate such sales district headquarters have been established at South Norwalk, Conn., Hog Island, Pa., Chicago, Ill., New Orleans, La., Alameda, Cal., Portland, Ore., and Tacoma, Wash. Each of the district directors of sales will be be authorized to make cash sales of property in amounts not exceeding $5000.—*The Nautical Gazette*, 22 October, 1921.

BOARD'S VESSELS TIED UP.—Indicative of the acute depression in shipping, 1241 vessels, out of a total of 2079 belonging to the Shipping Board, are now tied up.—*The Nautical Gazette*, 22 October, 1921.

AMERICAN SHIPS CARRYING LESS OF OUR FOREIGN TRADE.—Foreign ships are rapidly regaining control of our import trade. In July, 1920, they carried only 36 per cent of the total, while in July, 1921, they carried 54 per cent, an increase of 18 per cent. During the same period American independent vessels increased their percentage from 32 to 36, while the Shipping Board lost 22 per cent. Shipping Board vessels handled only 86,788 tons of imports (10 per cent of the total) in July, 1921—a record low figure—and only one-sixth of the total carried in July, 1920.

On the other hand, foreign ships are not appreciably increasing their hold on our export trade. In July last they carried 60 per cent of the total outward cargo movement as compared with 58 per cent in the same month of 1920. American privately owned craft increased their proportion from 17 to 25 per cent while that of the Shipping Board fell from 25 to 15 per cent.—*The Nautical Gazette*, 22 October, 1921.

NATIONALITY OF MERCHANT SHIPS PASSING THROUGH PANAMA CANAL.—According to the *"Panama Canal Record,"* the number and net tonnage

of the ships of the various maritime nations passing through the Panama Canal from the time of its opening to June 30, 1921, was as follows:

Nationality	Total
Argentinian	2,335
Belgian	8,623
Brazilian	23,730
British	16,638,644
Chilean	1,331,220
Chinese	42,900
Colombian	161
Costa Rican	7,290
Cuban	9,994
Danish	1,079,643
Dutch	1,008,479
Ecuadorian	66
Finnish	4,281
French	726,067
German	120,089
Greek	14,575
Honduran	606
Italian	233,142
Japanese	2,106,581
Jugo-Slovak	4,508
Mexican	29,820
Nicaraguan	1,644
Norwegian	3,113,207
Panaman	3,051
Peruvian	1,027,523
Portuguese	9,002
Russian	57,192
Spanish	308,710
Swedish	527,924
United States	16,206,857
Uruguayan	410
Totals	44,648,274

—*Nautical Gazette*, 22 October, 1921.

AERONAUTICS

THE "JL-12" ATTACK PLANE.—The *JL-12* Attack Plane was designed and built by John M. Larsen, a well-known engineer and inventor, who in the course of his aerial touring has flown between 250,000 and 300,000 miles in this country and Europe. It is a type in advance of the latest foreign all-metal planes. The plane is 32 feet long with a wing spread of 49 feet and carries 130 gallons of gasoline. When manned by pilot and gunner and equipped with 3000 rounds of ammunition and fuel for 500 miles of fight, it weighs 5000 pounds. Its radius of action in battle is 400 miles from its supply base. The engine is a 400-horsepower Liberty motor.

The main battery of the plane consists of twenty-eight machines guns arranged in two sections. The first section is of twelve guns located directly behind the pilot's seat, and the second of sixteen guns, is mounted to the rear.

The firing is done by the manipulation of three levers, one firing half the battery, another the other half, the third being a master lever which puts all twenty-eight guns into action with a single motion. The two remaining guns of the thirty are fired at will by the pilot or gunner from the cockpit. The replacement of fresh magazines for all the guns requires only four minutes.

The plane itself is constructed of American-made duralumin. The metal sheets are 25-1000 of an inch thick, more than twice the thickness of that used in the latest foreign all-metal planes. It is braced throughout with steel, there being a powerful criss-crossing of rods in the wings, which are two feet thick at their greatest diameter.

In designing this plane, it was Mr. Larsen's idea to provide a flying machine which, through its high speed, its sensitiveness under control and its ability to climb rapidly, could be used successfully against infantry either on the field of battle or while "going up," or to the rear, or to attack a convoy on a roadway. The intent of the plane is to swoop down upon the enemy, fly low over him, perhaps at not more than 50 feet from the ground, and loose an annihilating fire from machine guns. After such a dash, the machine is to climb swiftly to give the gunner time to adjust new magazines to the guns and then to return to the attack.

By manipulation of the ailerons of the plane, the latter can be made to rock back and forth above the object attacked and thus spray the ground with bullets for a wide distance. The forward Thompson guns are set at a slight forward angle, six in the second battery point directly downward and the remainder are trained slightly aft, so that fire from the plane flies in three directions simultaneously.

The circular drums for the Thompson guns contain 100 cartridges and the ammunition equipment for the plane in battle trim consists of three drums for each of the thirty guns, a total of 9000 cartridges.

In discussing the machine Mr. Larsen stated: "It has been put through the most severe tests already and the flying and the battery performance have been perfect.

"One marked feature of the plane is its climbing ability. During a recent test it climbed the first 1000 feet in 45 seconds and rose to 10,000 feet in less than 12 minutes. It is as fast as a scout plane and has high qualities of maneuvering at speed.

"Nothing has been overlooked to make it an irresistible weapon of war. Infantry, either in the open or intrenched cannot possibly withstand its sheer velocity of flight and its appalling fire. It flies too fast to afford a target. It sets a pace which is strides ahead of anything like it in the world, and the best part of it all is that this plane is of American material and workmanship throughout."

Specifications.—Type—All-metal monoplane.
Span—49 feet.
Length Overall—32 feet.
Height to Top of Cabin—400 horsepower.
Motor—Liberty 12—400 horsepower.
Control—Dual dep.
Weight of Plane empty (including cooling water)—2900 lbs.—*Aerial Age Weekly*, 7 November, 1921.

REDUCTION IN NAVAL AIR SERVICE.—The curtailment of the activities of the Navy Air Service up to date has closed the stations at Cape May, N. J.; Yorktown, Va. (branch of the Hampton Roads Air Station), and Rockaway, N. Y. This leaves operating stations on the Atlantic Coast at Hampton Roads, Va., Lakehurst, N. J., Anacostia, D. C., and Pensacola, Fla., and on the Pacific coast at San Diego, California. Of these the Hampton Roads and the San Diego stations are the only sizeable ones now existing, as far as the navy is concerned.

Due to the crash in England of the *R-38* the airship station at Lakehurst is in a peculiar situation. What will be done with the station remains to be worked out following the financial settlement over the *R-38*, which will soon be taken up with the British government. If it is possible to obtain—as some of the high officers of the Bureau of Naval Aeronautics hope—one of the British dirigibles as part payment in the settlement, the activi-

ties at the Lakehurst station will be resumed. Otherwise they will cease for about a year, when it is expected that the airship *ZR-1*, now building at the station, will be completed.

The Anacostia station, just outside of Washington, is maintained largely for experimental purposes. It is not regarded as an ideal naval air station in the accepted sense.

The station at Pensacola serves for training purposes, to supply fliers for the Atlantic and Pacific fleets.—*Aviation*, 24 October, 1921.

BRITISH PLANES WITH LITTLE PLANES UPON THEM.—Experiments with a remarkable type of battleplane which carries its own scout machine poised at the tip of one of its wings have been carried out at Farnborough, England. Two big bombing planes have been flying over Aldershot with a diminutive airplane fixed to the upper wing. So far it is understood that the tests have been successful. The parent machines have traveled at their usual pace, although the engine of the scout machine was kept running so that it was ready to dive off at a minute's notice to protect the larger and heavier craft. The automatic releasing apparatus is constructed on ingenious lines, we learn from *Aerial Age Weekly*. An expert pilot is carried by the bombing plane and as soon as his services are required he climbs through the top wing and takes his seat in the scout plane. By pressing a trigger he frees the smaller machine which at once glides along the battleplane wing and dives off.—*Scientific American*, 15 October, 1921.

NEW THEORY OF THE SLOTTED WING.—In a paper recently read before the Society for Aeronautical Science at Munich, Dr. Betz dealt with a certain development in sustaining planes or aircraft wings due to Lachmann in Germany and Handley Page in England. The object is to increase the lift by providing slots in the wing parallel to the leading edge. If these are to be effective they must extend without interruption across the entire width of the wing. This arrangement may also be regarded as an extra plane of small depth placed in front of the main wing at its leading edge so that there is only a very small space left between the two. The maximum lift of the plane is thereby increased by 80 per cent or more. There are different explanations of this phenomenon. One is that the small plane located in front of the main plane is located in an air stream whose conditions of flow are determined by the main wing. It follows that at the leading edge of the main wing the air speed materially exceeds the speed of flying. The reactions of the air on the small wing in front therefore are considerably greater than if it passed through space at the flying speed.

The new explanation of Dr. Betz is based on the fact that for a given speed the lift of a plane increases with the angle of incidence until the air stream on the upper surface can no longer follow that surface. If the angle of incidence becomes too big, a new condition of flow develops, the air stream separating from the plane, creating a field of eddies which grows with the angle of incidence. Such eddies have a tendency to form even in the case of small angles of incidence, but the air, passing over the plane, immediately washes them away, and thus maintains a smooth, lift-creating stream. In the case of large angles of incidence this becomes impossible. But if the air stream on top of the plane is reinforced by air passing through the slot in the wing from the under to the upper side, the lift-creating flow conditions can be maintained even with larger angles of incidence. New energy is being supplied to the air stream on top of the plane by the air flowing through the slot, which enables it to continue to wash away the eddies. This energy has to be paid for, however, the phenomenon being accompanied by increased drift of the slotted plane as compared with a plane without slot.

This new explanation is valuable for the reason that it furnishes a basis for judging the value of new plane combinations of the kind referred to,

and facilitates the arrangement of systematic test series in a field where the number of possible combinations is almost without limit.—*Automotive Industries.*

FLEET WILL TEST ANTI-AIRCRAFT GUNS ON RAG MEN IN GLIDERS.—Rag men will be used to "man" a fleet of gliders that will be under fire of anti-aircraft guns on ships of the Atlantic fleet in forthcoming maneuvers off the Virginia Capes and Cuba the latter part of the winter. It is planned to launch the gliders from navy dirigibles at a height of from 3000 to 5000 feet. The rag men will be fastened in the gliders to prevent the machines from turning over in the downward flight they will take after they are released. The presence of the rag men in the gliders will also given American gunners using small arms a charge to prove their marksmanship in picking off crews of an aerial enemy craft.

It is proposed to release the gliders in groups of five. Naval experts say the gliders, in their flight downward, will maintain an average speed of about 45 miles an hour, about half the speed an aviator in full flight would average in an attempt to escape guns on warship after delivering an attack.

Practically every ship in the Atlantic fleet will take part in the attack of the gliders.

An elaborate program of aerial target shooting and maneuvers is being prepared for use when the Atlantic fleet goes to Guantanamo the coming winter. Most of the fleet will assemble off the Virginia Capes within the next few weeks for preliminary target practice, which will include experiments with gliders and box kites. The latter style of target has been used in previous aerial target shooting and resulted in excellent records for navy gunners using small arms. Box kites are made fast to ships with ropes and permitted to soar at heights varying from 500 to 1200 feet.

The gliders will be larger than those used in land maneuvers by the army and navy. Each glider, it is said, could easily carry two live men with utmost safety.—*Aerial Age Weekly,* 24 October, 1921.

NAVY HAS CATAPULT TO LAUNCH PLANES.—Secretary Denby announced October 16 that, after much experimentation, the navy has developed a catapult for launching aeroplanes from battleships which will soon be tested. A complete catapult unit is now ready for installation on a battleship, and if the invention meets expectations in tests in service, the machine can be produced in quantity and all battleships of the fleet can be rapidly supplied with this new form of aviation equipment.

The catapult consists of a carriage moving on tracks. On this carriage is mounted the aeroplane. The carriage is caused to move on the tracks at an increasing speed until, near the end of the tracks, its speed is sufficient to permit the aeroplane to take the air. Then the carriage is brought to rest by means of suitable brakes and shock absorbers. The apparatus can be made in varying sizes so as to be adapted to the launching of any aircraft likely to be used from surface ships.

Normally, when an aeroplane takes off from the flying field, it runs along until it has attained a speed through the air sufficient to sustain it aloft. This is known as its minimum flying speed. After attaining such a speed on the ground, it can be so controlled as to take the air and to remain up so long as this minimum flying speed is maintained. The length of run necessary is dependent upon the type of plane concerned and its loading, the wind, and the nature of the terrain.

In case of a very lightly loaded plane, such as a single-seat plane, with a strong wind against the direction run, the length of run required before leaving the ground would be very short. However, as a rule, the length of run required is considerable, and under unfavorable conditions it may be several hundred feet. To supply this starting speed from the ships the catapult has been developed.

When a plane is launched from the deck of a battleship by means of a catapult it cannot land on the deck of the vessel at the end of the flight. Thus planes which will be used from battleships must possess some means of flotation. At the end of a successful flight they will alight on the water in the lee of the ship and be hoisted on board by cranes.

In the case of planes operated from proper aeroplane carriers, they may be launched by means of catapults from the carriers, or, under favorable circumstances, may take off directly from the flying deck of the carriers, as from a field. Also, at the end of their flight they may alight on the landing decks of the carriers, where they will be brought to rest gradually by the arresting devices now being developed.

In the absence of the catapult in recent efforts to launch aeroplanes from battleships platforms were built on the top of turrets and supported by the muzzles of the guns. The turret was so trained as to point the plane directly into the wind.

Under favorable conditions it was found possible to launch small light-loaded aircraft. The apparatus was heavy and cumbersome and interfered with the turret on which it was used. The plane was not locked to the platform while it was attaining flying speed, and a side gust was liable at any time to cause a serious accident.

The catapult will be built into the ship which is to use it and will be so installed as not to interfere with any other part of the vessel. It is believed in navy circles that in the near future all surface ships will be equipped with catapults and aircraft as they are now equipped with small boats. By a system of tracks the aeroplanes will be run from their hangars onto the upper decks of the surface ships and the carriages of the catapults.

Normally, while the ships are cruising or in bad weather, the planes will be kept under cover in the upper decks, some disassembled and some partially assembled. Up to the present, due to the fact that aircraft are of such recent development in use on ships, the apparatus necessary for them has not been "built in." Naval officers say the battleships of the future will be designed undoubtedly to take their catapults, necessary hangar space, machine shops, the tracks and their aircraft, just as they are now designed to take their turrets and guns.—*Aerial Age Weekly*, 24 October, 1921.

REPORT ON THE "R-38" INQUIRY.—The report of the court of inquiry appointed to investigate the causes of the accidental destruction of the rigid airship *R-38*, which has just been issued, confirms the opinion, privately expressed after the disaster, that it was due to structural weakness.

The report, which is noteworthy for its frankness, states that the airship while flying at approximately 1200 ft. over the Humber, broke in two, due to the failure of the structure to the rear of the after engine cars while being subjected to control tests.

The findings of the court of inquiry confirm evidence introduced at the inquest into the disaster. They say that fire, probably originating from a spark from electric wires, was mainly responsible for the large loss of life. They note that a quick reversal was being made at the time of the accident, bringing a heavy strain on the after-portion of the hull of the craft, due to the swing of the stern.

Then the court found, among other things, that "the requirements as to maximum height and speed, together with limit in length imposed by the only available construction sheds, necessitated the utmost economy in design, and it appears evident that in some cases there was lack of vital aero-dynamical information as to the effect of these modifications on the strength of the structure."

The latter paragraph should be of particular interest to all those concerned with development of American rigids. It is quite natural that the *ZR-2* disaster should have provoked considerable discussion as to the wisdom of having experimental ships for our government built abroad. It

is equally natural for the incidental question to come up as to why such an important matter of policy was not thoroughly discussed before the disaster instead of afterward.

The answer to this latter question can and should be made perfectly clear to our minds. The main issue evolved is simply this, whether it is better to accept as fundamental the foreign designs and constructions, subsequently improving them where possible; or if it is better to base the principal reliance on our own designs and constructions with the incidental object of using foreign experience to the best possible advantage.

There are no *a priori* grounds on which such an argument could be based. It is simply a matter of ascertaining which system will produce the best results.—*Aviation,* 17 October, 1921.

ERECTION OF THE "ROMA" UNDER WAY.—The airship *Roma,* recently purchased from Italy, and delivered to Langley Field, is being erected in the huge hangar at that field. Inflation of the envelope started September 21, and by Friday, the 23d, over 1,000,000 cu. ft. of hydrogen had been fed through two 6-inch gas lines.

The *Roma* entirely fills the 410 ft. hangar, necessitating mooring the *D-3* to the Vickers mast in the open.

Due to the great amount of rigging yet to be attached, and the fineness of adjustment for this rigging, it is estimated that the *Roma* will not be ready to fly before January 1, 1922.—*Aviation,* 27 October, 1921.

ITALIAN AIR APPROPRIATION.—For the fiscal year ending June 30, 1922, the Italian Government has appropriated 42,700,000 lire for the Army Air Service and 22,060,000 lire for Civil Air Service, both services being under the jurisdiction of the War Department.

With regard to the appropriation for military aviation, the largest sum is allotted for the renewal of aviation material (16,500,000 lire). Next in order is 13,000,000 lire for gasoline, oils, etc. For expenses incidental to the preparation of flying personnel 4,800,000 lire is allotted; maintenance of buildings, and airdromes 2,200,000 lire; special compensation to flying personnel, 2,400,000 lire; conducting experiments of aircraft and aircraft armament, 2,050,000 lire; repair and maintenance of planes, motors, and other material, 1,300,000 lire; aerial photography, 150,000 lire; and miscellaneous expenditures, 300,000 lire.

Of the appropriation for civil aviation, 4,500,000 lire is allotted as subsidies to private aeronautical concerns for the operation of airdromes and aerial routes by heavier-than-air and lighter-than-air craft; 2,300,000 for carrying out studies and experiments; 3,000,000 lire for construction purposes; 2,460,000 lire for the operation of a preliminary flying school; and the remaining 7,200,000 for miscellaneous purposes. An additional appropriation, not yet determined, is to be allowed the Civil Air Service for the construction of commercial airplanes.

The salaries of army personnel are paid out of other appropriations for the support of the army. Many of the airdromes are also supported from funds appropriated for the maintenance of army posts. It is estimated that the army and civil air services receive from other appropriations to cover various services such as maintenance of posts, pay of the army, etc., 50,000,000 lire, making a total sum to be expended for military and commercial aviation in Italy during this fiscal year of approximately 112,760,000 lire, or slightly over $28,000,000.—*Aviation,* 31 October 1921.

ENGINEERING

THRUST METERS IN MARINE WORK.—On account of the practical difficulties involved, actual measurements of thrust in a ship's shafting were confined to attempts on a very small scale until quite recently, and the later

successful instances do not seem to have received the attention which they merit. Both Messrs. Cammell Laird and Co. and Messrs. Denny had conducted a few trials of this nature, and in 1908 the Vulcan Company, of Stettin, had succeeded in measuring the thrusts of the turbine-driven light cruiser *Stettin*, of 22,000 shaft horsepower, but nothing of a really satisfactory nature had been accomplished prior to the trials of H. M. S. *Mackay*, a large destroyer flotilla leader of 1800 tons and 44,000 shaft horsepower, which was completed at Birkenhead in 1919. Full details of the thrust meter employed and of the trials were published in *The Engineer* of August 29, 1919, and an analysis of the latter was given in a paper by Mr. Holt to the Institution of Naval Architects in 1920. The extremely interesting results obtained merit careful attention on account of their unique nature and the valuable deductions which can be drawn from them. The thrust meter used was of a type evolved by Messrs. Cammell Laird and Co. after many experiments with other designs, and consisted essentially of a series of 3½-inch oil cylinders incorporated in the casing of the *Michell* thrust block, arranged with their axes concentric with the shaft, and with their pistons in contact with the abutment ring carrying the bearing pads. The product of the oil pressure and the areas of the cylinders sufficed to measure the thrust, which on many occasions ran up to a figure of about 60 tons on each shaft.

The results obtained in H. M. S. *Mackay* might reasonably be regarded, not with suspicion—though as being at least unconfirmed were it not for them we should like corroboration of certain points—but for the fact that shortly afterwards the Bath Iron Works, Maine, U. S. A., used a thrust meter of different design in the United States destroyer *Pruitt*, which they had constructed, and whose trials took place in September, 1920. A very full description of both vessel and trials appeared in the *Journal* of the American Society of Naval Engineers in February last. The thrust meter used in the *Pruitt* consisted of an attachment to the *Kingsbury*—which is the American form of the *Michell*—thrust block, which was fitted to the forward end of the gear wheel shaft. In principle, it consisted of a thin flexible copper disc, about 22-inch in diameter, placed in a closed chamber at the end of the shaft, from which it was separated by a film of oil, and operated by oil pressure on the face of the disc remote from the shaft. This thrust meter arrangement is not unlike the footstep bearing used in vertical turbines, whether steam or water-driven, where the weight of turbine, shaft-and generator, often running into large figures, is supported on a film of oil. The U. S. S. *Pruitt* is a vessel of about the same speed as the *Mackay*—35 knots—but slightly smaller, being 1200 tons displacement, and having about 27,000 shaft horsepower. A very full analysis of the trials was made by Mr. J. Burkhardt, of the Bath Iron Works, which enabled an interesting comparison to be made with those of the *Mackay*. It is not our intention to elaborate the individual performances, but to call attention to the fact that in both cases the operation of these meters enabled a measurement of thrust over a range of speed to be obtained, which, by its ease of application and reliability of measurement, offers a method of solution of many problems connected with both resistance and propulsion which for lack of such apparatus have hitherto defied precise analysis. Even in their apparently considerable divergence of results—for the individual analyses of Messrs. Holt and Burkhardt are susceptible of considerable expansion and detailed comparison—the two performances corroborate one another to a very marked extent, and the broad facts which ensue from their evalution undoubtedly contribute no small measure of mutual support to a comparison from which much is to be learnt. Without entering into details, we may note that the measurement of thrust in these cases, as in that of the *Stettin*, cast considerable light on questions of actual wake and hull efficiency values, on propeller performance, and on the differences between the estimated resistance of the ship from tank experiments and that actually measured. Reliable thrust meter readings put an

entirely different complexion on the value of experimental data, confirming it or modifying it, as the case may be. Whether cavitation is present or not, thrust meters show precisely what the propeller is doing, and by deduction from the effective horsepower of the model enable the uncertain influences of air or appendage resistance to be assessed. When cavitation is present—and it is probably far more prevalent than is generally imagined—it is very difficult, if not impossible, to make any accurate calculations of the thrust horsepower delivered by the screws, and even when it is not regarded as affecting results there are frequently discrepancies in propeller performance, calculated from the results of trials of models, which the use of a thrust meter largely discounts. The measured thrust per square inch of projected area of screws ran up to 15.7 lb. per square inch in the *Pruitt* and to just 15.0 lb. in the case of the *Mackay*, figures which are considerably on the high side, according to some authorities. But though the *Mackay's* propellers (on the deep load trial) were obviously breaking down, the *Pruitt's* were still continuing to work with high efficiency. Calculated from the effective horsepower of the model with appendages, the respective pressures were 14.8 lb. and 12.5 lb. This is but a small instance of the light shed on some unsolved propeller problems by this measurement; the values of hull efficiency and wake factor obtained by these measurements were distinctly different from those which might have been (and without adequate basis) anticipated from other trials. Thrust measurements will not solve the problem of the propeller efficiency of the ship, but they remove a most important element of doubt regarding its performance; the determination of the wake factor in the ship, as distinct from the amount found by experiment in the tank, is still essential before the real slip, and hence the efficiency, can be accurately estimated. But the evaluation of this, as shown by Mr. Holt, can more readily approximated when the true thrust is known. For the determination of the effect of various conditions of bottom, which is so necessary before full-scale proof of the laws of surface friction can be obtained, thrust meter trials offer a prompt and reliable solution. It would not be surprising to learn that experiments of this nature have already been conducted, and whether the advantage to the profession as a whole or the commercial value of the knowledge thus acquired will affect their publication remains to be seen. It would seem that this is information which might properly be obtained by experiments in naval ships. It is, however, a subject which is really of greater importance to the mercantile marine, where the fact is gradually being appreciated that the saving of one effective horsepower means, roughly, two of shaft horsepower.

But it is mainly in the facilities which it affords for the comparison of experimental data with observations in practice that the value of the thrust meter will be found. It possesses the paramount advantage of giving the actual resistance of the whole ship under any condition or combination of conditions of loading, trim, weather, state of sea, depth of water, or condition of bottom; quite apart from the comparative data to be gained regarding the differences between trial and service performance, such matters as astern performance and maneuvering data can be elucidated, while the use of actual screws to corroborate model results for purposes of design can now be placed on a very definite footing.—*The Engineer*, 7 October, 1921.

FEATS OF KITCHEN RUDDER.—One of the interesting exhibits at the Shipping, Engineering and Machinery Exhibition held recently at the Olympia in London was the Kitchen rudder, a photograph of which is reproduced. It consists of two curved deflectors formed of parts of a cylinder enclosing the propeller. Both deflectors are pivoted at the top and bottom on common centers, and are operated by two shafts, one of which is solid and the other hollow, the latter being concentric with the former. By suitable mechanism the deflectors are made to turn together in the same direction or equally in opposite directions.

When the deflectors are opened out they permit the boat to travel at full speed. When these are partially closed, with the engines still running, the boat can only proceed at half speed. When the rudder is closed still further, the boat will remain stationary, as the water churned by the propeller cannot pass behind the rudder in sufficient volume to send the ship forward. When the deflectors are closed altogether, the water reacting on the rudder causes the vessel to go astern. From full speed ahead to a standstill can be accomplished in less than a boat's length. In swinging astern with the rudder hard over, half a circle can be made easily within a radius equal to half the length of the boat.

One of the remarkable features of this type of rudder is the control secured of a vessel when backing and this without changing the direction

Photo by Wide World

THE KITCHEN REVERSING RUDDER.

or speed of the engine. Moreover, in the case of a high speed engine requiring a propeller with a low pitch, efficiency is not lost in backing as the engine always runs in one direction, while with an ordinary reverse gear the low pitched propeller would be very inefficient for backing if properly designed for going ahead.—*The Nautical Gazette*, 22 October 1921.

CHANGE URGED IN METHOD OF PRODUCING POWER FROM OIL.—Discussing the application of oil to power purposes before the Oil Conference at the Shipping Exhibition at Olympia, London, Mr. Sydney North said that the progress of the use of oil for power production is entirely dependent on our engineers and chemists, the former for introducing a system which will attain the greatest evaporative power on a minimum consumption, the latter for adapting the large variety of oils available to the purposes for which they are required.

Up to the present time, the former have restricted their efforts to the identical lines laid down as far back as the 'sixties, which involved the forcing of oil in its natural state through a small orifice, thus splitting up the oil into a fine spray enabling combustion to be obtained more readily. It is true that improvements have been made in the burner itself, and the arrangements in the interior of the furnace have been carefully studied, but the main principle remains the same.

It is always difficult to deviate from a fundamental idea once it has been adopted and worked on for many years, but if our oil fuel engineers would

think outside the one dominating the burning of oil under boilers they might arrive at a system of producing power from oil which would effect a very great reduction in the consumption of the fuel and attain greater efficiency. It might be worth while bringing the oil fuel system into juxtaposition with the principle of obtaining power in the Diesel engine and the hot-bulb engine and ascertaining whether any part of the method employed in the latter could be adapted or modified in such a manner as would give the desired improvements in direct oil firing.—*The Nautical Gazette,* 22 October, 1921.

MOTORSHIPS AS EXPRESS CARGO CARRIERS.—Commenting on the report that the North Star Company (Johnson Line) of Stockholm, which possesses a fleet of about 130,000 tons, one half of which is motor driven and the remainder steam driven, have decided to sell their steamers and purchase motor boats, our Liverpool correspondent writes that there is undoubtedly a great future for the motor-driven express cargo boat and for motor-driven combination passenger and cargo vessels. When equipped with internal combustion engine power, such vessels can attain a speed of sixteen knots without their fuel consumption exceeding that of an eleven to twelve knots geared turbine steamer of similar dimensions, whilst the absence of boiler water and the great reduction in the quantity of fuel required enables about 15 per cent more cargo to be carried.

Proof of the reliability of motor ships is furnished by the *Selandia,* built by Burmeister and Wain, and put in service in February, 1912. She is a twin-screw vessel of 7400 tons deadweight and has a speed of 10½ knots. Each engine of eight cylinders develops 2500 i.h.p. of 140 r.p.m. She has covered nearly 500,000 miles and is still in steady service, whilst large numbers of steamships built since the Armistice are laid up due to their inferior operating economy.—*The Nautical Gazette,* 29 October, 1921.

NAVIGATION AND RADIO

NEW LIGHTHOUSES ON SOUTH AMERICAN COAST.—Sixteen automatic lighthouses furnished by a Swedish company have been installed at various points on the coast of Ecuador. Those at Santa Clara and Santa Elena have a visbility of sixteen and a half miles; others at Punta Española, Punta Arenas, and Jambelí have a radius of fourteen and a half miles, while the rest are visible eight and a half miles. The iron tower of the lighthouses is fifteen meters high. The automatic lanterns flash a spark every three seconds.

Details of the contract to be granted by the Venezuelan Government for the installation of seven lighthouses along the coast have been made public. There is to be a twenty-mile light for the northernmost extremity of the peninsula of Paraguana, a fifteen-mile light at the entrance to the port of Maracaibo, two twelve-mile lights at Punta Juanes and Punta Mangle respectively, and three six-mile buoys at the western end of the peninsula of Araya, in front of the port of Pedernales, and at the entrance to the Cano Macarreo, which is the principal mouth of the Orinoco River.—*The Nautical Gazette,* 12 October, 1921.

PETROGRAD'S PORT APPROACHES.—The British Russian Trade Delegation states that ships bound for Petrograd will find stationed off Narva Bay a large lightship marked *Priemny* with wireless telegraphy and pilots aboard. The latter will take ships to Cronstadt free of charge. The course from this pilot station to Cronstadt is clearly marked by buoys and has been swept clear of mines. At Cronstadt another pilot takes the ship to Petrograd docks free of charge. This last stretch of channel has a navigable depth of 28 feet.

There are no consuls, shipping agents, stevedores or private agents at Petrograd. The government reserves the right to carry on all business

pertaining to shipping through its own officials. No charges are being made as yet for pilotage, dock or light dues. The necessary labor and appliances for the handling of cargoes are being supplied free of charge for the present.—*The Nautical Gazette*, 29 October, 1921.

ORDNANCE

AIR TORPEDO TESTED.—A successful mechanically controlled flying torpedo, destined to revolutionize land and sea warfare, has been developed for the United States Army and Navy air services. In a secret test, made two weeks ago, this remarkable aircraft, said to be the most important aerial weapon ever constructed, flew over New York City and two Eastern states. According to aerial experts here, the flying torpedo, had it been loaded, could easily have wrought great destruction to lower Manhattan.

The experiments have been carried on for several months on Chesapeake Bay, in New Jersey and Ohio in strictest secrecy, not more than 100 persons in the entire country having any knowledge of it. The machine already has made upward of a hundred flights, approximating 5000 miles.

Its existence undoubtedly will exert a profound influence upon the Conference on the Limitation of Armament, which opens here this week, because development of the craft, according to the experts, means that coastal fortifications are rendered obsolete.

Attacking in large numbers, machines of this type would be able to annihilate cities with incendiary explosives and poison gases without the loss of one life to the attacking forces, the experts declare. In actual warfare the flying torpedoes will be guided through the air to their targets without a person on board.

During the flight over New York City the experimental flying torpedo made an unexpected landing near a small town in eastern Pennslyvania. This incident attracted little attention at the time.

Upon receiving a report of the landing of the mysterious aircraft, however, the New York *Tribune* began an investigation, and now is in a position to outline the characteristics of this remarkable machine and its possibilities. The details of construction and control are still shrouded in mystery.

The test flight on that occasion commenced from a landing ground near New York. After the engine was started the machine ran a short distance across the field, and then took the air successfully and climbed to the predetermined altitude. It then set a course due west, straight into a stiff head wind.

The most remarkable feature of the new craft is the development which causes it to take off from the starting field. The secret apparatus controlling the elevators, which govern the ascent and descent of an aeroplane, is absolutely successful, according to the experts who have watched the experiments. For straight flying across country the machine is equipped with apparatus which gives it inherent stability, causing it to right itself under all conditions.

From official sources it is learned that the flying torpedo is designed for offensive action against enemy coasts, cities or fleets. In naval warfare it will be further controlled by radio, and at no time will machines of this type fly more than twenty feet above the surface of the sea during naval engagements. It can be flown at any altitude while being used in attack against cities or coast defenses. The flying torpedoes will be filled with incendiary explosives and poison gases.

The object of flying low in naval battles is based on two important factors. First, the present indicated defense against attacking aeroplanes—besides other aircraft—is detonation set up by a barrage of anti-aircraft guns. The theory of this defense is that, while no attempt is made to obtain a direct hit, a terriffic air disturbance will be set up by the exploding shells, making it practically impossible for the attacking machines to approach their objectives. This, of course, will be obviated by low flying.

The other factor is based upon the fact that when a machine is flying very low there is a back pressure of air from the ground—or sea—which tends to keep the machine in the position in which it is flying. This, with the radio control, will make the flying torpedoes almost invincible, as only a direct hit will put them out of action.

In this manner hundreds of the machines can be set to fly straight toward a fleet, and then circle around until they strike one of the battleships. Or they may be directed by an attacking fleet against enemy cities from a distance of 200 miles or more.—*Aerial Age Weekly*, 14 November, 1921.

MISCELLANEOUS

THE POLISH NAVY.—Some of the references to the transfer of three of the ex-German torpedo boats to Poland are calculated to mislead those who do not follow such matters very closely. In the accounts in several papers of the picturesque and impressive ceremony which took place recently in Leith Roads, when the Polish flag was solemnly blessed on board, and holy water was sprinkled over the vessels by a Catholic priest, it appeared to be thought by the writers that the vessels were fighting craft, many references being made to Poland as a sea power, and to Poland's embryo navy. Actually the ships are unarmed. The Supreme Council, when allocating the ex-German and ex-Austrian men-of-war to the various Allied and Associated Powers last year, decided to entrust all 50 of the surrendered German torpedo boats to Great Britain. All but 12 were to be broken up, and of those spared, six were to be selected by Poland and six by Brazil, after being disarmed, to be used for police duties only. At the Supreme Council meeting at which this arrangement was made, the Poles expressed a preference for the style of certain ex-Austrian vessels, and asked whether Austrian destroyers could not be sent to Danzig, but for technical reasons it was decided that it would be impossible to accede to the suggestion. It seems advisable to point out the real facts at this juncture, if only because they may remove false impressions which might otherwise be created on the continent, and particularly in Russia.—*Army and Navy Gazette*, 1 October, 1921.

THE RUSSIAN NAVY.—In returning to the Soviet Government the ice-breaker *Alexander*, which was among the ships taken over at Archangel late in the war, the Admiralty has done a good turn which ought to be rightly appreciated, for the *Alexander* is a most useful vessel, and one which the Russians need very much. It is also understood that negotiations are proceeding for the return of the ice-breaker *Sviatogor* if a certain sum is paid for her. Both the *Alexander* and *Sviatogor* are fairly new vessels and British-built. They were constructed by Messrs. Armstrong on the Tyne in 1915-17. It will be remembered that when a Russian steamer was ice-bound in the Kara Sea in the spring of 1920, the Soviet Government had to admit that it was without the necessary resources for a relief expedition, and the British Government accordingly lent the *Sviatogor* for the undertaking, which was successfully carried out under the leadership of M. Sverdrup, the Norwegian explorer. Since the two ice-breakers mentioned are unarmed, there should be no objection raised to their being handed over to the Russians, but the cruiser *Askold* and two destroyers, which have been under British protection since 1918, are in a different category, and we hope that due and proper safeguards will be asked for and received before they are returned. We cannot forget that not many months ago a Soviet Minister, when launching a submarine in the Black Sea, said that he hoped it would sink an Entente vessel.—*Army and Navy Gazette*, 8 October 1921.

THE DUTCH EAST INDIES.—More than casual interest attaches to the recent Admiralty order touching the voyage to the Dutch East Indies of

the Netherlands submarine *K-6*. This little vessel, which may call at Falmouth early in the present month, is on her way to join the naval forces entrusted with the defense of Holland's most valuable over sea possessions. According to the text books she is quite a new boat, displacing 800 tons when submerged, with a surface speed of 16 knots and a cruising range of 5500 miles. Eight other boats of the *K* class are built and building. The Dutch Navy is understood now to include about 18 completed submarines, while many more are in course of construction or have been authorized. The new submarine programme may be of larger dimensions than is generally known, for a report was published in Berlin last January that the Dutch Government had placed an order with the firm of Thiess for 18 submarine Diesel engines, six of 450 horsepower and twelve of 1200 horsepower. The boats, it was added, would be built in Dutch yards. Apparently ten of the latest submarines are earmarked for service in the East Indies fleet—officially designated the Indian Marine—which already includes the finest surface vessels of the Netherlands Navy.

Java, Sumatra, and the other insular possessions in the Pacific have a total area of 735,000 square miles, so that Holland has to provide for the defense of Pacific colonies which are more than seven times as large as the Mother Country. Her stake in that ocean is therefore a considerable one, and the upkeep of the local naval and military forces costs her nearly £8,000,000 per annum. The Dutch Minister of Marine, in a speech last year, intimated that, although it was hopeless to think of defending single-handed these colonies against attack by a great power, the object was to provide a naval force sufficiently strong to hold an invader in check pending the arrival of aid from another quarter—the implication being that Holland, in such a contingency, would appeal to some powerful neighbor for armed assistance. Submarines are peculiarly adapted to coastal defense, and it is probable that the Dutch authorities are expanding their underwater fleet more with an eye to possible emergencies in the Far East than in Europe.—*Naval and Military Record*, 5 October, 1921.

CURRENT PROFESSIONAL PAPERS

The Purpose and Nature of a Fleet. *Nineteenth Century*, October, 1921.

Wireless Telephony. *Annual Report of Smithsonian Institute*, 1919.

National Ports. *Proceedings of American Society of Civil Engineers*, October, 1921.

The Fortress of Heligoland. *The Engineer*, 21 October, 1921.

The Negatron: A New Negative Resistance Device for Use in Wireless Telegraphy.—*Engineering*, 21 October, 1921.

NOTES ON INTERNATIONAL AFFAIRS

FROM OCTOBER 10 TO NOVEMBER 10

PREPARED BY

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WASHINGTON CONFERENCE

PLANS FOR NAVAL REDUCTION.—The formal opening of the conference on Reduction of Armaments in Washington was scheduled for October 12. Press reports prior to the opening of the conference indicated that the American delegation would present a carefully worked out plan for a general reduction of naval armaments.

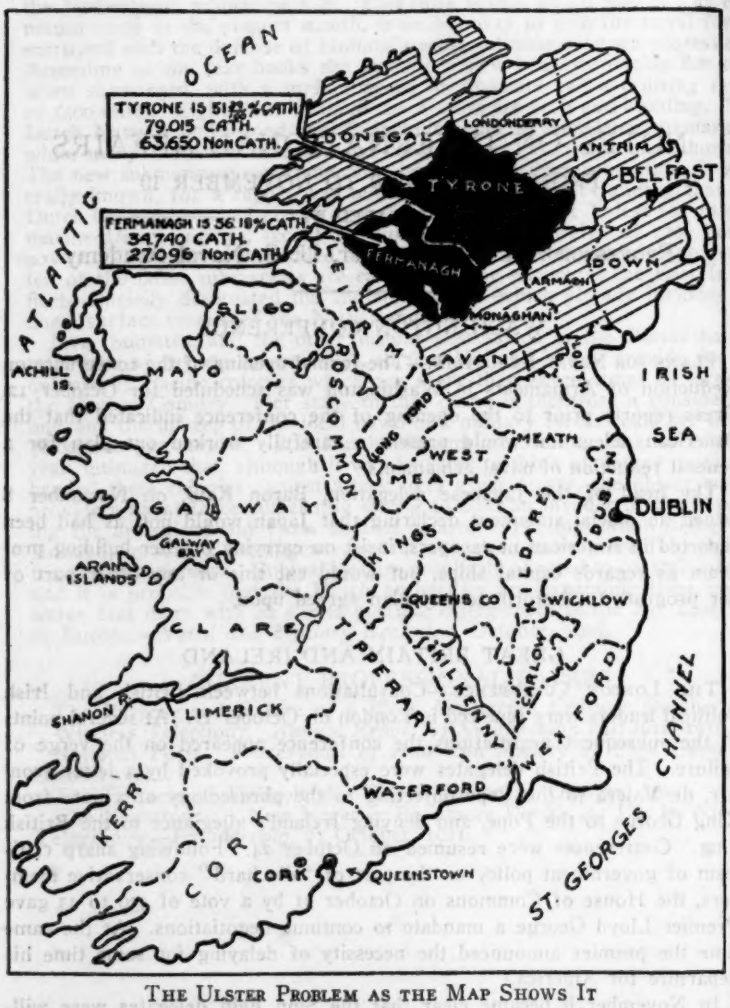
The head of the Japanese delegation, Baron Kato, on November 8 issued an official statement declaring that Japan would not, as had been reported in American newspapers, insist on carrying out her building program as regards capital ships, but would cut this or any other part of her program to conform to any plan agreed upon.

GREAT BRITAIN AND IRELAND

THE LONDON CONFERENCE.—Consultations between British and Irish political leaders were renewed in London on October 11. At several points in the subsequent negotiations the conference appeared on the verge of failure. The British delegates were especially provoked by a letter from Mr. de Valera to the Pope objecting to the phraseology of a note from King George to the Pope, and denying Ireland's allegiance to the British king. Conferences were resumed on October 24. Following sharp criticism of government policy on the part of "die hard" conservative members, the House of Commons on October 31 by a vote of 439 to 43 gave Premier Lloyd George a mandate to continue negotiations. At the same time the premier announced the necessity of delaying for some time his departure for America.

In November it became clear that the Sinn Fein delegates were willing to accept the English demands, including admission of allegiance to the king and provision of military and naval safeguards in Ireland, on condition of certain concessions on the part of Ulster, involving the possible transfer of the counties of Tyrone and Fermanagh and the inclusion of Ulster in closer political union with the southern government.

SOLUTION DEPENDENT ON ULSTER.—Following a conference in London between Premier Lloyd George and Premier Sir James Craig of Ulster, the latter summoned the Ulster Cabinet to London on November 10 for



THE ULSTER PROBLEM AS THE MAP SHOWS IT

The shaded portion with the two counties in black comprise Ulster. London advices have stated that a final settlement of the whole Irish difficulty might hinge on Ulster's willingness to yield Tyrone and Fermanagh, both largely Catholic, to the Sinn Fein.

With the two counties in question added to the South, the Northern Government would have jurisdiction over less than half of the province, which has an area of 8613 square miles, while its population is hardly a million and a quarter, having shrunk from 2,286,622 in 1841 to 1,581,350 in 1901.

Tyrone has an area of 1260 square miles. Its population has shrunk from 313,000 in 1841 to 150,470 in 1901. Fermanagh has an area of 714 square miles. Its population in 1881 was 84,879 and twenty years later, 65,243. In Fermanagh the Catholics predominate in small communities on the eastern, southern and western border. The center and northern parts, adjoining the Catholic part of Tyrone, are predominantly non-Catholic.—*N. Y Times.*

consultation. British press reports indicated that the Ulster leaders would not at once reach a decision, but that the prospects of concessions on their part were not bright.

In the meantime, the Ulster Government was granted judicial, educational, agricultural, and financial powers as provided in the Home Rule Act, and was extended an appropriation of £1,000,000 for the construction of a parliament house.

GERMANY

SETTLEMENT OF SILESIAN QUESTION.—The Council of the League of Nations, to which the Silesian problem was referred by the Allied Powers, reached a decision which was accepted by the powers and communicated on October 20 to Germany and Poland. The solution was in the nature of a compromise which, roughly speaking, bisected the industrial triangle in dispute. At the same time provision was made for a commission composed of two Germans and two Poles with a neutral chairman to draw up a convention for the preservation of economic unity in the region thus divided. Details of the decision follow:

The boundary runs from a point where the Oder River crosses the Silesian border on the south through Rybnik to Niobotechau and gives Poland most of Rybnik province and all of Pless. Of the industrial basin Germany keeps Gleiwitz and Zabrze as well as the city of Beuthen. Poland gets Koenigshutte and Beuthen country, Kattowitz City and Kattowitz Country. The districts of Tarnowitz and Lublinitz are split, the western part going to Germany and the eastern to Poland. Germany keeps the northern and western part of the Upper Silesia.

The decision sets forth that the commission of two Germans, two Poles and a member named by the League of Nations shall prepare an accord for putting into effect the Allies' orders to preserve the economic interests of the territory involved. For fifteen years the railroads of both sections must be operated as one system with the same rates for both sides of the border. A reciprocal agreement must be established for water and electric supplies. The existing German currency shall be used for fifteen years throughout the district.

For fifteen years raw products from both sides of the line shall pass duty free to other parts of the industrial zone, and provision made for free passage of half finished products from one side of the border and back again under special permits. Both countries will agree during the prescribed fifteen years to take no unduly restrictive measures affecting the other section of the industrial area. On the basis of the average business year from 1911 to 1913, Poland shall supply to Germany a proportion of the product of the coal mines she gets and Germany shall furnish a proportion of iron ore for fifteen years. For fifteen years residents on one side of the line who work on the other shall pass freely on a commission pass without further formalities.

In case of any dispute arising which the commission is not able to settle amicably, either government may refer it to the League of Nations and must bind itself in advance to accept the findings of Geneva.

CABINET REORGANIZATION.—The Silesian decision, depriving Germany of a part of the industrial and mineral resources it had hoped to retain, brought about a crisis in German politics and finance. It was asserted that the loss of territory would take from Germany 84 per cent of Upper Silesian

anthracite coal (or 42 per cent of Germany's total deposits), all of the zinc production of the region, and about 60 per cent of the Upper Silesian iron industry.

A cabinet reorganization took place marked chiefly by the withdrawal of the Democratic party from representation in the government. On October 26 the Chancellor, Dr. Wirth, announced a new ministerial state, the only actual changes in which were that the Foreign Minister, Dr. Rosen, was dropped and his duties taken over temporarily by the Chancellor, and a new minister of justice was named. The so-called "Cabinet of Predicament" was supported by the Reichstag by a vote of 230 to 132; it can count, however, only on the Centrists and Socialists, and less certainly on the Democrats, making 216 out of a total of 469 votes. The German People's party, or party of "big business," agreed only to a benevolent neutrality.

SENATE RATIFIES GERMAN PEACE TREATY.—On October 18 the U. S. Senate ratified the treaties ending war with Germany, Austria, and Hungary. The vote on both the German and the Austrian treaties was 66 to 20 (52 Republicans for and 2 against, 2 Democrats for and 14 against). Exchange of ratifications on November 8 made the Austrian treaty effective, and it was expected that ambassadors would at once be appointed.

THREATENED FINANCIAL COLLAPSE.—*Paris, November 6.* Announcement made here last evening that the Reparations Commission had decided to go to Berlin is being interpreted as showing that the situation while acute, is not yet beyond the possibility of arrangement.

The proclaimed object of the visit of the commission is to ascertain what has been done by the German Government, and what remains to be done toward the payment of $120,000,000 due on January 15, as the second instalment of the reparations payment which Germany accepted under the ultimatum last April.

Under Article 248 of the Treaty of Versailles the commission has first charge upon all assets and revenues of the German Empire. If, therefore, the German Government finds itself unable to pay and in a position to pledge some of its revenues and assets, it can do so only by consent of the commission. On the spot all the necessary information can be better secured and consent more rapidly given.

The need for hurry lies in the fact that Germany must be, by order of the Committee on Guarantees, by November 15 in a position to produce a percentage of the total payment due on January 15, and that by December 1 25 per cent of the value of foreign exports must also be available, under Paragraphs A and B, Article 7, of the Accord of London. To obtain these sums, which must be paid in gold or foreign values, the German Government can negotiate either with German bankers or abroad, and in order to do so it is understood that she wishes to be relieved from the lien which the Commission on Reparations has on the resources.—*N. Y. Times*, 7/11.

PORTUGAL

REVOLUTION IN LISBON.—On October 19 a revolutionary uprising in Lisbon forced President Almeida to dismiss the Granjo Cabinet, dissolve parliament, and accept a new ministry headed by the revolutionary leader Col. Manuel Coehlo. Four members of the Granjo Cabinet were put to death. The new government proclaimed martial law, condemned the murders committed, and succeeded in reestablishing order.

RUSSIA

SOVIET OFFERS TO RECOGNIZE DEBT.—On October 30 the Soviet Government issued a wireless message announcing that it was ready to recognize and make arrangements for the payment of the national debt of Russia up to August, 1914, in return for formal recognition by the powers.

In reply on November 2 the British Government expressed its pleasure that Russia had seen the necessity of recognizing its obligations as preliminary to a renewal of economic relations. The British note made inquiries as to the status of loans, claims, etc., subsequent to August, 1914, and as to other points not made clear in the Soviet message.

HUNGARY AND SOUTHEASTERN EUROPE

HUNGARY EXPELS HAPSBURGS.—Leaving Switzerland by airplane in violation of pledges to the Swiss Government, the former Emperor Charles and former Empress Zita reentered Hungary on October 21, in a second effort to regain the Hungarian throne. On the march from Odenburg to Budapest, the forces of Charles were defeated by troops of Regent Horthy, and the royal couple were captured and interned.

Through their ministers in Budapest, the Allied Powers on October 24 issued an ultimatum to Hungary demanding the deposition of Charles, his arrest, and his expulsion under terms to be fixed by the Allies. The nations composing the Little Entente at once mobilized on the Hungarian frontiers and on October 27 sent a 48-hour ultimatum demanding not only the deposition of Charles but reimbursal for the cost of mobilization.

The Hungarian Government, acceding to these demands, passed a law disbarring all members of the Hapsburg family from the throne. On November 1 the ex-emperor and ex-empress were turned over to the Allied Powers and went aboard the British gunboat *Glowworm* for transportation down the Danube, and ultimately to the island of Madeira, where it was proposed that Charles should be interned.

In the meantime the insurgent Hungarian forces holding Burgenland continued to oppose the surrender of that territory to Austria on the terms finally agreed upon by the conference on that subject held in Venice.

MONTENEGRO OUT OF EXISTENCE.—On October 21 Queen Melina, widow of Nicholas I of Montenegro, signed an order relieving her ministers of their duties, and thus terminating the agitation to continue Montenegro as an independent state. Montenegro was merged, in November, 1918, into the new Jugoslav state. Although Italy for a time encouraged Montenegrin propaganda for independence, her support was withdrawn after the Treaty of Rapallo (December, 1920) with Jugoslavia.

ALEXANDER TAKES JUGOSLAV THRONE.—On November 5, King Alexander, son of the late King Peter, took the oath of office as sovereign of Jugoslavia. It was stated that the king had nearly recovered from the illness which delayed his return from Paris to the Serbian capitol.

PROTECTION FOR ALBANIA.—After a long delay, during which Albania was invaded by both Greek and Jugoslav forces, the Allied Council of Ambassadors on November 5 re-established the Albanian frontiers as they existed prior to the war. Notes were at once sent to the Greek and Jugoslav governments requesting the withdrawal of their troops. The British Government called the attention of the League of Nations Council to conditions in Albania as threatening international peace.

FRENCH TREATY WITH KEMAL PASHA.—On October 30 the French Government announced ratification of a treaty with the Turkish Nationalist Government at Angora, providing for the resumption of peaceful relations and economic cooperation. France withdraws from Cilicia, the line between Turkey and the French protectorate of Syria is established just south of the Bagdad railway east of the Gulf of Alexandretta, and France gains economic advantages, including a concession for operating the Bagdad Railway from the Mediterranean to the Tigres river and mining rights in northern Asia Minor. Negotiations for this agreement had been carried on for some time previously by the French agent Henry Franklin Bouillon.

BRITISH PROTEST.—Immediately upon the publication of the Franco-Turkish agreement the British Government sent a note to France protesting against certain of its terms. When this note was communicated to Premier Briand in Washington, he indicated that his reply would take the lines: (1) that the British had been aware of the general terms of the accord and that their objections were therefore belated; (2) that the accord follows the terms of the agreement outlined in London last spring, to which the British never objected.

The real cause of the dispute seems to be in a clash of the two policies which France and England have separately pursued in the Near East ever since the end of the war. The French have constantly endeavored to obtain a settlement by what they call a positive policy—dealing with the facts of the situation as they found them. The British policy on the other hand has been as constantly negative in its refusal to recognize Mustapha Kemal as the de facto government of Turkey with consequent admission of Turkish independence.

The French are more than pleased with the success of their policy with its fruitful consequences in reduction of military expenditure in Cilicia and increase of moral prestige in the Near East as respecters of Mussulman independence. There is in newspaper comment a note of satisfaction that France has taken from England the lead in liberalism and contrast is made between the "puppet show of independence made by King Feisul in Mesopotamia" with the real independence of Kemal freely recognized by France.

Unconfirmed news reached Paris to-day that Mustapha Kemal is completeing his preparations for an aggressive winter campaign against the Greeks. This news, however, is regarded rather as a bluff intended to hurry the Greek Minister Gounaris into making concessions in the terms which he is now trying to arrange in London as a basis for mediation by the Allies.—*N. Y. Times*, 9/11.

UNITED STATES

SENATE PASSES FREE PANAMA CANAL BILL.—On October 10, the U. S. Senate by a vote of 47 to 37 passed the Borah bill giving to vessels in the American coastwise trade the right of free passage through the Panama

Canal. The bill was passed in spite of the desire of President Harding that it should not be taken up at this time, and in spite of the opposition of the Republican leader, Senator Lodge. The bill went to the House where it is likely to be held up until the armament conference is well under way, if not concluded.

FAR EAST

JAPANESE PREMIER ASSASSINATED.—On November 5 Takashi Hara, Premier of Japan, was stabbed to death in a railway station of Tokio. The murderer, a 19-year-old Japanese named Nakoka, was captured and indicated in his confession that his deed was premeditated and the result of political fanaticism.

CHINA DEFAULTS PAYMENT ON AMERICAN LOAN.—On October 31 the U. S. Department of State sent a message to the Chinese Government to the effect that failure on the part of China to pay principal and interest on the loan of $5,000,000 made by the Continental and Commercial Trust and Savings Co. of Chicago and due October 31, would detract from China's financial and political credit in the United States and make it difficult for the United States to continue to recognize the Peking Government. The Chinese Government's reply on November 6 declared its purpose to secure a refunding of the loan at the earliest possible moment.

In connection with China's financial difficulties, it was asserted by the British adviser of China, Mr. Lenox Simpson (Putnam Weale), that the refusal of China last year to accept the 16 million dollar loan offered by the consortium of powers through the agency of Mr. Thomas W. Lamont was due to Mr. Lamont's insistence that China recognize the Hu Kuang bonds of German issue which China repudiated on entering the war. It was asserted that the J. P. Morgan Co. held $3,000,000 of these bonds. Mr. Lamont issued a vigorous denial of these charges.

CHINA REBUFFS SHANTUNG OFFERS.—Replying to China's refusal (October 5) to consider the Japanese proposals relating to Shantung, Japan on October 19 published another note justifying her position and calling attention to the fact that the Japanese acquisition of Shantung had been recognized by China before her entry into the war, and could not therefore be affected by any action upon China's entry. The reply of China on November 4 restated her reasons for considering the Japanese offers unsatisfactory, and again refused to enter negotiations on such a basis. The reply was summarized in part as follows:

"The Chinese memorandum of October 5 points out the difference in views between China and Japan regarding the principles underlying the Japanese proposals and the contents and terms thereof. If the Japanese Government understood these differences, she would very surely have proposed a more substantial and more just project, which would universally be recognized as fair. It is most regrettable, however, that the Japanese Government has given no sign of concessions, while maintaining that China is openly unwilling to proceed with negotiations.

"China was unable to sign the Versailles Treaty owing to the Shantung article, whence it is impossible to compel her to recognize the effects, arising from the treaty regarding Shantung. Japan considers that the Kiao-Chau leasehold was transferred to her by the operation of the treaty, while China deems the leasehold to have expired through her declaration of war against Germany. If both countries insist on this difference in viewpoint a solution of the problem would be rendered forever impossible, but since Japan is willing to restore Kiao-Chau completely to China, further necessity for Japan's insistence on the point in the dispute does not exist.

"Regarding the German declaration concerning Shantung, China, when the Chino-German commercial agreement was negotiated, insisted on her demand for the restoration of Kiao-Chau, but Germany could only regret to China that Germany's power for returning Kiao-Chau had been lost through a force majeure, which explanation China simply acknowledged. Hence it is a serious misunderstanding for Japan to construe this incident as meaning China's recognition of the Versailles Treaty.

"It must be observed that the Kiao-Chau-Tsinan-Fu railway was not public German property, or private property exclusively German-owned, but was built within Chinese territory and had a corporate nature, with Chinese capital invested, and that China had long looked for the opportune moment for its reclamation.

"Further, the right of policing was exclusively China's, and absolutely no military necessity justified Japanese occupation. China, thereupon, repeatedly protested the Japanese army's occupation of the railway as unjustified, pointing out that German troops were never stationed along the line, except within the leased territory. When China entered the war for the Allies, the properties of all the Chinese railways should have been returned to Chinese control, but the Japanese troops have remained, refusing to withdraw and causing endless losses to the Chinese along the railway.

"The Chinese memorandum of October 5 proposes, regarding the claim of right to control of the railway, to divide the entire capital and property into two halves, stating that China will redeem the Japanese half within a fixed period. This arrangement being most fair and just, the Japanese statement that China's proposal is devoid of meaning, is regrettable."

REVIEW OF BOOKS

"Modern Seamanship." By Rear Admiral Austin M. Knight, U. S. Navy (Retired). Price $7.00. (D. Van Nostrand Company, New York City.)

During the last twenty years, seamanship has been gradually taking her place among the progressive arts. The reasons are, of course, that the modern ship is a machine; that the modern battleship is the most powerful machine in the world, and yet the most delicate in proportion to her power; and that the destroyer, and still more the submarine, are more highly developed products of science and invention than even the physical and chemical laboratories of most colleges. As invention succeeds invention, every technical art changes to take advantage of them; and, as virtually every technical art is now represented on board of ships, and especially of naval ships, the art of handling those ships has become a technical art, and must necessarily change also.

Since no man can skilfully practice any technical art unless he keeps in practical acquaintance with the changes in that art, and since seamanship is one of the most exacting of all the technical arts, because it deals with the lives of men in continual possible peril, the seaman owes it to himself and to the ships and the men whose safety depends upon him, to keep up to date continually with the changes in seamanship.

To assist the seaman to do this, is evidently the object of the eighth edition of this book; so clear is the author's effort to illustrate and describe the many changes that have taken place since the seventh edition appeared in 1917. These changes were caused mainly by the requirements of the great World War. The principal changes in the book are the addition of the chapters on submarines and submarine chasers, and the amplification of the chapter on destroyers. Another change, nearly as important, is the additional chapter headed "Assistance by Public Vessels to Vessels in Distress," which was prepared by two officers of the Coast Guard, and which gives the seaman the benefit of all the expert knowledge and skill of that excellent organization, that has been developed by years of practice and experience.

For the reasons that the author published his first edition when he was head of the Department of Seamanship at the U. S. Naval Academy; that he has published six separate editions between the first one and the present; that he has, during the twenty years that have elapsed, commanded two navy ships, been president of the Special Board on Ordance, Commander-in-Chief of the Reserve Fleet, President of the War College and Commander-in-Chief of the Asiatic Fleet—and that he has therefore not only kept in

close touch with seamanship itself but with all branches of the naval profession—for all these reasons, the reviewer feels a natural reluctance to express his individual opinion about any of the views expressed by the author, or any of his conclusions or declarations. If the present author is not *facile princeps* in the matter covered by his book—who is?

It might be, of course, that, despite his intimate knowledge of the subject, the author might be unable to communicate his knowledge to others. But a careful perusal of "Modern Seamanship" brings out the fact that the author is a master of diction; that his style is smooth and pleasant, and that his descriptions are so clear as to present real pictures to the mind. Furthermore, these pictures are reinforced by 199 full page plates, some of which include several separate figures. And while each of the plates is well executed, some are executed with a degree of finish and beauty that seems hardly necessary in a text book.

Yet it cannot reasonably be denied that the more attractively a text book is prepared, the more favorably it will impress the student; the more his interest will be aroused, and the more clear will be the impressions made on his mind and memory. And when one considers the immense amount of knowledge that the authorities have to force into the brains of midshipmen now, he must admit that anything which helps the midshipmen to assimilate it is a work of mercy.

So many and great have been the changes in ships and ships' equipments during the past of four years, that some changes and additions have had to be made in nearly every chapter in the book, even the chapters on "Rope" and on "Knotting and Splicing." The chapter on "The Compass, Log and Lead—Submarine Signals" has been made to include the Radio Compass and the system of piloting by its use. The chapter on "Boats" has been amplified and enriched with several additional plates. The chapter on "Ground Tackle" contains many new and important changes and additions. The chapter on "The Rules of the Road," is, in its general arrangement, the clearness of the descriptions, the author's notes concerning them and the really beautiful colored pictures which illustrate them, one of the most satisfying expositions that I have ever seen in any text book on any subject. Almost in the same class are the chapters on "Maneuvering to Avoid Collison," "Piloting," "Handling a Steamer Alongside a Deck," and "Placing a Ship in Dry Dock." The admirable chapter on "Weather and the Laws of Storms" has not been changed materially in the text, but the illustrations have been improved. The chapter on "The Handling of Destroyers" is extremely interesting, almost exciting: especially the latter half. The chapter on "Submarines" is entirely new. The chapter on "Keeping Stations and Maneuvering in Squadron" is so well up to date that it includes a discussion of the handling of the Idaho. The chapter on "Towing" has been revised, and so has the Appendix.

While the book is designed primarily for use as a text book, the fact should not be overlooked that it has a field of usefulness of perhaps even greater importance as a work of reference. It is, in fact, a very storehouse of information on the many subjects of professional interest which are

constantly arising in the every-day experiences of sea-faring life; and many a midshipman who look upon it during his course at the academy as of only temporary interest will find himself referring to it again and again, throughout his professional career, for the answers to questions which are answered nowhere else so fully and so clearly. In this fact lies the *raison d'être* of certain parts of the book which may find no place in the curriculum of the academy.

Not only the author but the publishers have done exceptional work in bringing forth this work; for paper, the type, the illustrations and the general appearance of the volume constitute a whole of which D. Van Nostrand & Co. may reasonably be proud.

B. A. F.

SPECIAL NOTICE

NAVAL INSTITUTE PRIZE ARTICLE, 1922

A prize of two hundred dollars, with a gold medal and a life-membership (unless the author is already a life member) in the Institute, is offered by the Naval Institute for the best original article on any subject pertaining to the naval profession published in the PROCEEDINGS during the current year. The prize will be in addition to the author's compensation paid upon publication of the article.

On the opposite page are given suggested topics. Articles are not limited to these topics and no additional weight will be given an article in awarding the prize because it is written on one of these suggested topics over one written on any subject pertaining to the naval profession.

The following rules will govern this competition:

1. All original articles published in the PROCEEDINGS during 1921 shall be eligible for consideration for the prize.

2. No article received after October 1 will be available for publication in 1921. Articles received subsequent to October 1, if accepted, will be published as soon as practicable thereafter.

3. If, in the opinion of the Board of Control, the best article published during 1921 is not of sufficient merit to be awarded the prize, it may receive "Honorable Mention," or such other distinction as the Board may decide.

4. In case one or more articles receive "Honorable Mention," the writers thereof will receive a minimum prize of seventy-five dollars and a life-membership (unless the author is already a life member) in the Institute, the actual amounts of the awards to be decided by the Board of Control in each case.

5. The method adopted by the Board of Control in selecting the Prize Essay is as follows:

(a) Prior to the January meeting of the Board of Control each member will submit to the Secretary and Treasurer a list of the articles published during the year which, in the opinion of that member, are worthy of consideration for prize. From this a summarized list will be prepared giving titles, names of authors, and number of original lists on which each article appeared.

(b) At the January meeting of the Board of Control this summary will, by discussion, be narrowed down to a second list of not more than ten articles.

(c) Prior to the February meeting of the Board of Control, each member will submit his choice of five articles from the list of ten. These will be summarized as before.

(d) At the February meeting of the Board of Control this final summary will be considered. The Board will then decide by vote which articles shall finally be considered for prize and shall then proceed to determine the relative order of merit.

6. It is requested that all articles be submitted typewritten and in duplicate; articles submitted written in longhand and in single copy will, however, receive equal consideration.

7. In the event of the prize being awarded to the winner of a previous year, a gold clasp, suitably engraved, will be given in lieu of the gold medal.

By direction of the Board of Control.

F. M. ROBINSON,
Commander, U. S. N., Secretary and Treasurer.

TOPICS FOR ARTICLES

Suggested By Request of the Board of Control

The Naval Policy of the United States.
The Navy: Its Past, Present and Future.
The Fighting Fleet of the Future.
Factors Governing American Naval Strength, Absolute and Relative.
The Navy in Battle; Operations of Air, Surface and Underwater Craft.
Escort and Defense of Oversea Military Expeditions.
The Place of Mines in Future Naval Warfare and the Rules Which Should Govern Their Use.
The Relation of Naval Communication to Naval Strategy.
The Influence of Topography on Strategy.
International Law.
Principles on Which Should be Founded the Freedom of Neutral Shipping on the High Seas.
The Present Rule of Neutrality Regarding Contraband and Blockade—Is it Justifiable in Ethics or in Expediency?
What Will be the Status of the Submarine in International Law?
Aircraft—Its Place in Naval Warfare.
Aircraft, Practical Power of.
Aircraft Warfare, Laws of.
Aviation—Its Present Status and its Probable Influence on Strategy and Tactics.
The Control of the Sea from Above.
The Navy Air Service, Its Possibilities, Rôle and Future Development.
The Anti-Aircraft Problem from the Navy's Viewpoint.
Surface Craft, Future Rôle of.
Armor or High Speed for Large Surface Vessels.
Naval Gunnery of To-day, the Problems of Long Range and Indirect Fire.
Mode of Design and Armament of Ships to Meet the New Conditions of Aerial and Sub-Surface Attack.
Future Development of the Naval Shore Establishment.
Naval Bases, Their Number, Location and Equipment.
Strategic Requirements of the Pearl Harbor Naval Station.
The Navy Yard as an Industrial Establishment.
A Mobilization Program for the Future.
Naval Organization from the Viewpoint of Liaison in Peace and War Between the Navy and the Nation.
Organization of a Naval Communication Service.
Scope of Naval Industrial Activity and the Navy's Relation of Naval Strength.
Social and Industrial Conditions in Relation to the Development of Naval Strength.
The Future of the Naval Officers' Profession.
The Naval Officer and the Civilian.
The Naval Officer as a Diplomat.
The Mission of the Naval Academy in the Molding of Character.
The Limits of Specialization in Naval Training.
The Training of Communication Officers.
Navy Spirit—Its Value to the Service and to the Country.
Morale Building.
Military Character.
Amalgamation of the Supply Corps, Construction Corps and Civil Engineering Corps with the Line of the Navy.
The Influence of the Term of Enlistment on the Efficiency of the Service.
Shore Duty for Enlisted Men.
Physical Factors in Efficiency.
Health of Personnel in Relation to Morale.
America as a Maritime Nation.
Our New Merchant Marine.
The Adaptability of Oil Engines to all Classes of War Vessels.

NOTICE

The U. S. Naval Institute was established in 1873, having for its object the advancement of professional and scientific knowledge in the Navy. It is now in its forty-eighth year of existence. The members of the Board of Control cordially invite the co-operation and aid of their brother officers and others interested in the Navy, in furtherance of the aims of the Institute, by the contribution of papers upon subjects of interest to the naval profession, as well as by personal support.

On the subject of membership the Constitution reads as follows:

ARTICLE VII

Sec. 1. The Institute shall consist of regular, life, honorary and associate members.

Sec. 2. Officers of the Navy, Marine Corps, and all civil officers attached to the Naval Service, shall be entitled to become regular or life members, without ballot, on payment of dues or fees to the Secretary and Treasurer. Members who resign from the Navy, subsequent to joining the Institute, will be regarded as belonging to the class described in this Section.

Sec. 3. The Prize Essayist of each year shall be a life member without payment of fee.

Sec. 4. Honorary members shall be selected from distinguished Naval and Military Officers, and from eminent men of learning in civil life. The Secretary of the Navy shall be, *ex officio*, an honorary member. Their number shall not exceed thirty (30). Nominations for honorary members must be favorably reported by the Board of Control. To be declared elected, they must receive the affirmative vote of three-quarters of the members represented at regular or stated meetings, either in person or by proxy.

Sec. 5. Associate members shall be elected from Officers of the Army, Revenue Cutter Service, foreign officers of the Naval and Military professions, and from persons in civil life who may be interested in the purposes of the Institute.

Sec. 6. Those entitled to become associate members may be elected life members, provided that the number not officially connected with the Navy and Marine Corps shall not at any time exceed one hundred (100).

Sec. 7. Associate members and life members, other than those entitled to regular membership, shall be elected as follows: "Nominations shall be made in writing to the Secretary and Treasurer, with the name of the member making them, and such nominations shall be submitted to the Board of Control. The Board of Control will at each regular meeting ballot on the nominations submitted for election, and nominees receiving a majority of the votes of the board membership shall be considered elected to membership in the United States Naval Institute."

Sec. 8. The annual dues for regular and associate members shall be three dollars, all of which shall be for a year's subscription to the UNITED STATES NAVAL INSTITUTE PROCEEDINGS, payable upon joining the Institute, and upon the first day of each succeeding January. The fee for life membership shall be forty dollars, but if any regular or associate member has paid his dues for the year in which he wishes to be transferred to life membership, or has paid his dues for any future year or years, the amount so paid shall be deducted from the fee for life membership.

Sec. 10. Members in arrears more than three years may, at the discretion of the Board of Control, be dropped for non-payment of dues. Membership continues until a member has been dismissed, dropped, or his resignation in writing has been received.

ARTICLE X

Sec. 2. One copy of the PROCEEDINGS, when published, shall be furnished to each regular and associate member (in return for dues paid), to each life member (in return for life membership fee paid), to honorary members, to each corresponding society of the Institute, and to such libraries and periodicals as may be determined upon by the Board of Control.

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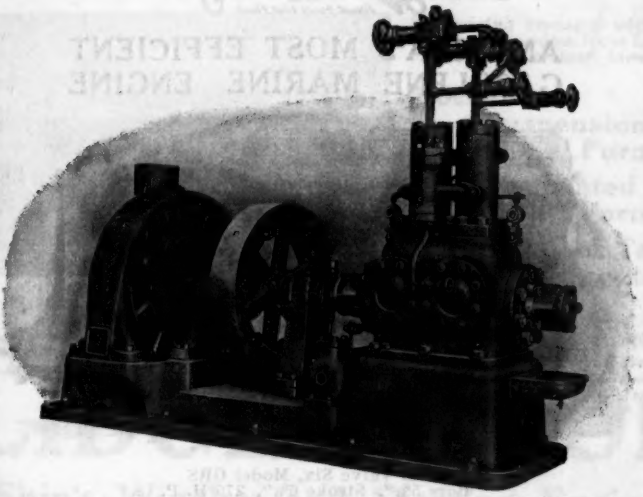

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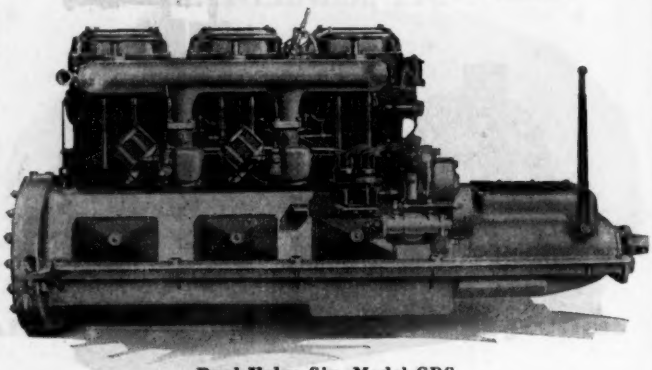

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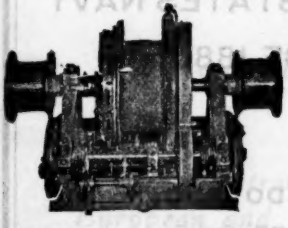

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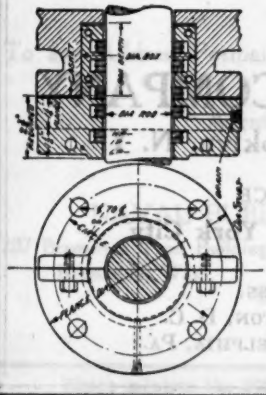

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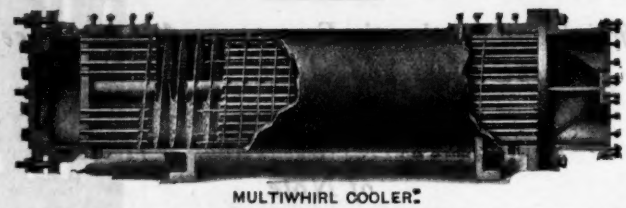

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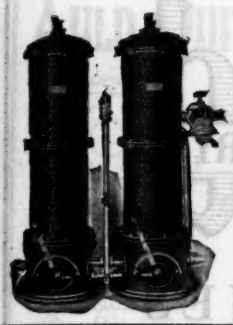

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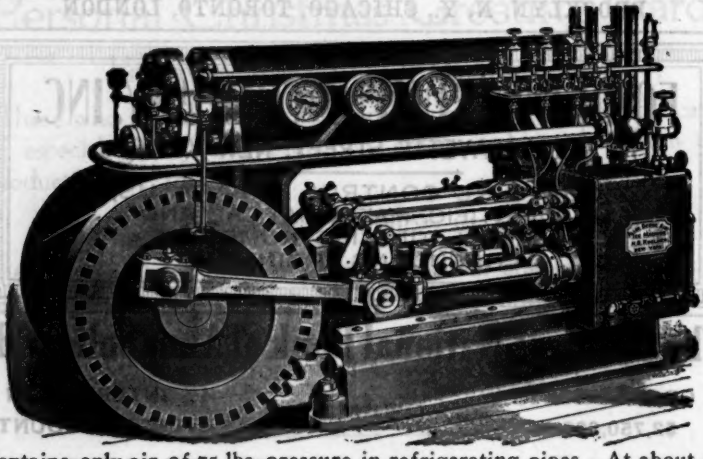

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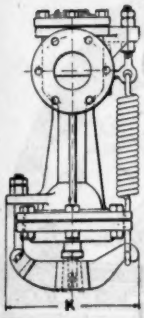

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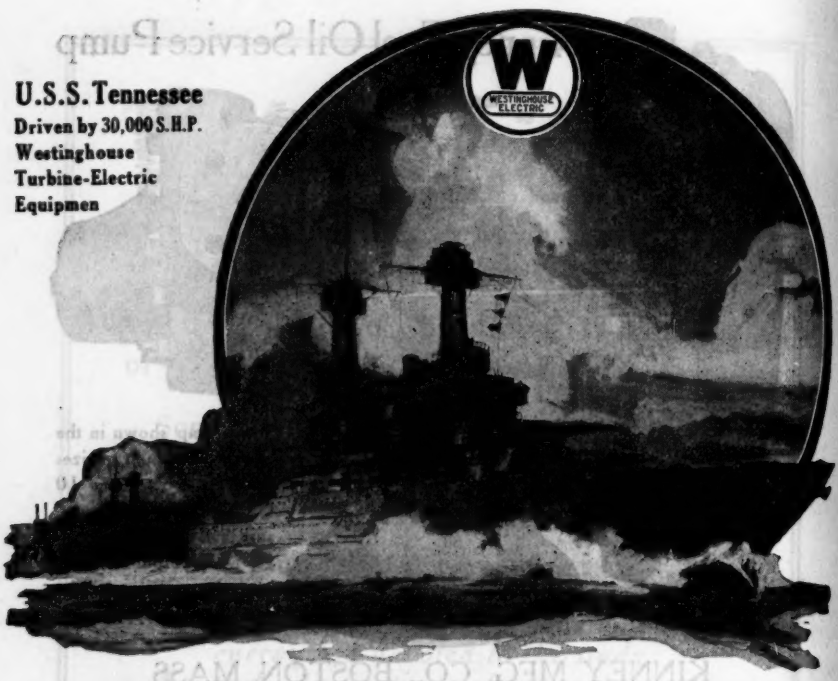

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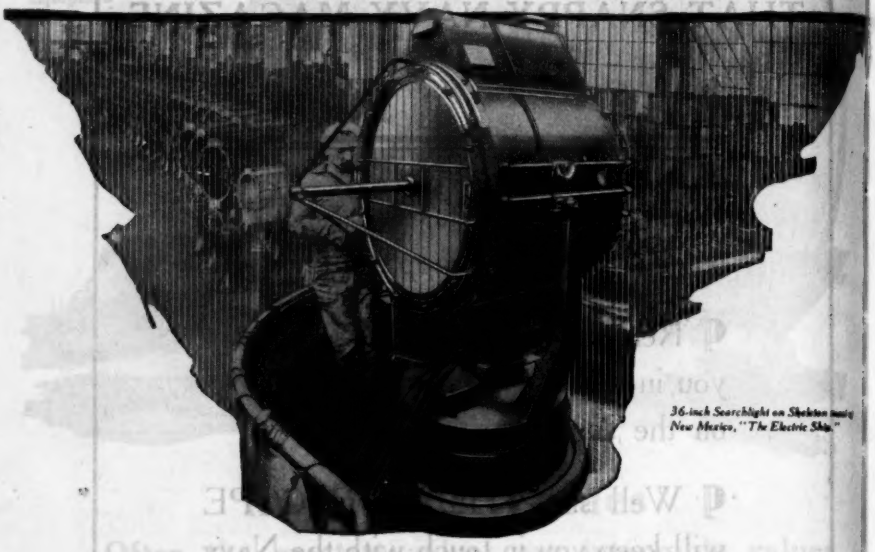

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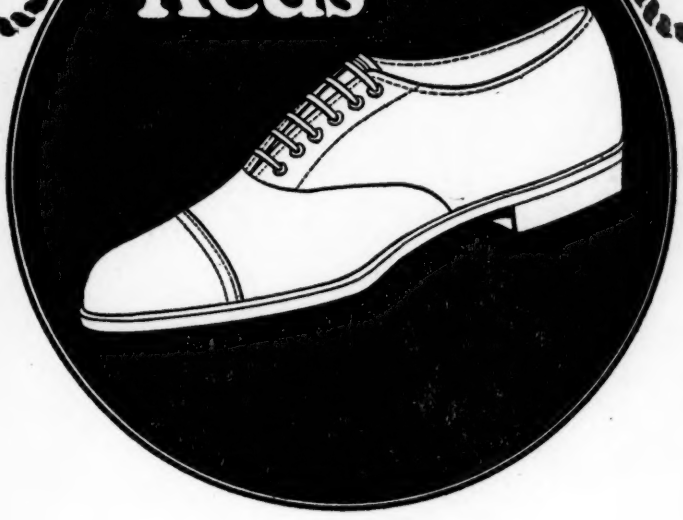

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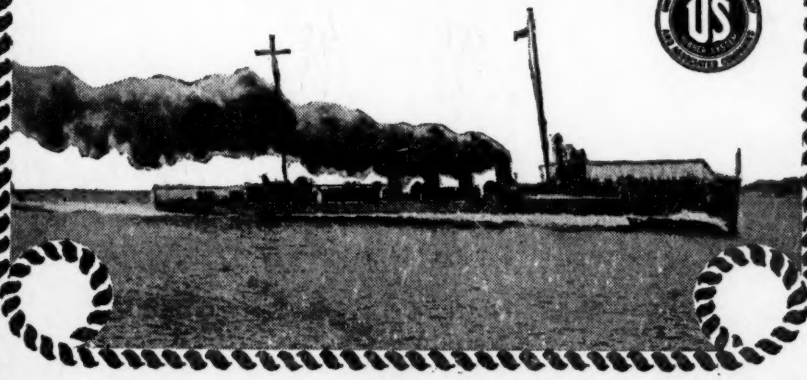

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